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No. IV. OF VOL. II., 1932. LONDON, SATURDAY, JULY 23, 1932 Pp. 128 — Price 1s.

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THE RÔLE OF GLUCOSE IN THE TREATMENT OF DIABETIC INTOXICATION

By H. P. Himsworth, M.D., M.R.C.P. Lond.
ASSISTANT TO THE MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL

Since the introduction of insulin the treatment of cases in all grades of diabetic intoxication has been revolutionised; but, whilst all will admit that with hospital and laboratory facilities brilliant results may be obtained, doubt and considerable trepidation still appear to beset the practitioner when he is faced with these cases in the absence of such assistance. This dangerous lack of confidence appears to originate in the idea that it is hazardous to treat such cases unless the treatment can be guided by frequent estimations of the blood-sugar, and naturally the complexity of the analytical methods involved in this procedure renders their performance, outside the laboratory, a practical impossibility. It is proposed in the following article to outline a method of treatment which is controlled by no more complicated chemical procedure than the testing of the urine for sugar and acetone. This method will ensure the automatic and inevitable recovery of non-comatose cases of diabetic intoxication, and in the few cases of full coma that have been under my care it has produced a more rapid recovery and a more stable result than those of my previous experience.

Theoretical Considerations

As the success of the method depends largely upon the whole-hearted application of its underlying principle, the latter will be presented in some detail with an outline of the considerations which led up to it. Relying as it does upon the free administration of glucose, the somewhat ambiguous position which this substance holds in present-day therapeutics of diabetic intoxication merits consideration.

The discovery of insulin occurred just when medicine had adopted a principle of diabetic treatment which rested upon the accumulated clinical and experimental evidence of the last 50 years. The principle had been enunciated that, whilst a diabetic could not live on a completely carbohydrate-free diet, inevitable deterioration in his condition resulted if these substances were not limited to a minimum. Practically such limitation had proved to be a great success, and it is not surprising that when insulin was discovered it was tacitly assumed that the combination of this proved method and the new remedy would provide the best line of diabetic treatment. We are only just beginning to realise the fallacies in this conclusion. From this assumption a treatment of diabetic coma was logically evolved in which sugar was only given to insulin-treated cases of diabetic intoxication as a remedy (or preventive) of hypoglycæmia when blood-sugar estimations disclosed that this was imminent. This method does not appear to have been changed in general work, although it has been modified by experience gained in forecasting the onset of hypoglycæmia.

If one consults the instructions of the authorities in this country on this subject one finds that, whilst some definitely state that their method is to give insulin without sugar to the comatose patient until the blood-sugar approaches normal levels, others, without deprecating the use of glucose, say that large doses of insulin may be given uncovered by sugar if blood analyses are available to guide treatment. All are agreed that in the absence of blood-sugar estimations glucose should be given along with insulin, but one is left in little doubt that the weight of medical opinion in this country is in favour of the initial administration of uncovered insulin as the method of choice. The employment of alternative methods patently arises from the idea that the main use of glucose in the treatment of diabetic coma is to guard against possible hypoglycæmia.

The attitude of the American authorities appears to be similar and is summed up by Joslin [1] in the words: "Actually there is no need for protecting the patient *against* insulin with glucose. It is better to concentrate on protecting the patient *with* insulin by watching changes in the blood- and urine-sugars in order that the proper amount of insulin shall be given."

The principle of the following method is that the essential therapeutic agent in the treatment of diabetic intoxication is glucose, and that unless this substance is present in sufficient amounts insulin is relatively impotent. Insulin, of course, must be given, but the fundamental idea is to give glucose, glucose always, and covered by the necessary amount of insulin—*not* insulin covered, if necessary, by glucose, as is the current practice.

It has long been known that diabetic intoxication is associated with the production of ketone bodies, and although their rôle as the causative agents of this condition has been challenged the practical observation remains that the onset of diabetic intoxication is heralded by an increase of ketone bodies in the urine; coma is marked by their presence and recovery characterised by their absence. It would appear allowable to conclude that although ketone bodies may not be the direct cause of coma, they at least act as indicators of its progression, and that if any method of treatment causes their quantitative diminution then it is fair to say that it has had a therapeutic effect on the essential cause of coma.

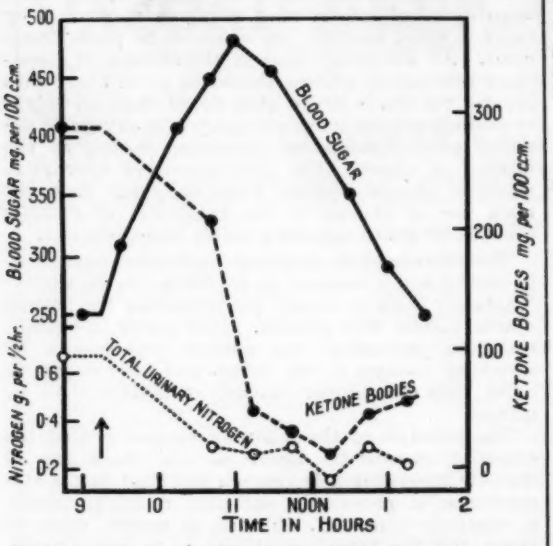
A TEST CASE

Having in mind the fact that an artificially induced ketonuria in a normal person can be completely removed by the giving of glucose, and knowing that mild ketonuria in a diabetic sometimes disappears during the performance of a sugar-tolerance curve, it was decided to investigate, quantitatively, the effect of the administration of glucose alone on a case of incipient coma. The results are given in the Figure and in Table I. (see p. 166.)

The patient was a woman aged 35 years, who developed symptoms of diabetes one year before admission. She was inadequately treated and her symptoms became more and more pronounced until finally, having got rapidly worse in the last few days, she was sent up to University College Hospital. On admission her urine gave a positive ferric chloride reaction and a maximum reduction of Benedict's solution. There was a strong smell of acetone in the breath and the depth of the respirations was increased. The patient was quite conscious but drowsy, and although the ocular tension was not perceptibly diminished the inelasticity of the skin indicated some degree of dehydration. It must be noted that the patient received insulin for the first time in her life after the following investigation was concluded.

The bladder was first emptied and a pint of water was given by mouth. Two hours later the procedure was repeated and it was hoped that by this means the body would be provided with sufficient water to enable it to get

rid in advance of as much nitrogen and ketone as possible. An hour later 50 g. of glucose were given by mouth and then at half-hourly intervals specimens of blood, expired air, and catheter specimens of urine were collected for analysis.



The time when glucose was given is indicated by the arrow. The percentage of ketone bodies excreted is charted because the results of Behre [4] suggest that in the absence of a marked diuresis, the amount of these substances excreted closely reflects the urine flow, and therefore the concentration in the urine gives a better idea of their concentration in the body.

I should like to state that the deductions given below were not arrived at from a consideration of this experiment, but that this unusual procedure was undertaken purely to obtain a demonstration of these conclusions which had been deduced from other evidence.

It will be seen that as the blood-sugar rises the amount of ketone bodies in the urine rapidly falls, and that as the curve descends these substances again increase in amount. The nitrogen excretion also declines, and this probably indicates that the ingested sugar has been utilised in sufficient amounts to retard the formation of new sugar from protein, and its continuation at a low figure signifies the persistence of this effect. The volume of the expired air is probably of some significance in reference to acidosis. Its initial diminution suggests a temporary decrease of the acid bodies in the blood and the subsequent larger volumes a corresponding increase.

These results suggest the following conclusions. That a case of diabetes, approaching coma, can still to some extent use glucose. That glucose alone can cause a retardation of the diabetic processes and a temporary return towards normal. And that these effects appear to be related to the height of the blood-sugar. When this rises the ketosis, acidosis, and protein breakdown diminish; and when this falls they accordingly increase. The suggestion follows that the reason a diabetic passes into coma is not because his blood-sugar rises but because it does not continue to rise.

In support of this paradoxical conclusion, the following two cases may be cited. The first was that of a woman who had been on a diet containing a very high proportion of fat and was admitted in coma with a blood-sugar of 350 mg. per 100 c.cm. The second was that of a young and severe female diabetic who for one year had been treated with a high carbohydrate diet and who was admitted after having, for five days, a temperature of 103° F. at night, and for two days, persistent vomiting. She was quite conscious and only showed moderate signs of diabetic intoxication. Her blood-sugar was 864 mg. In the light of the above experiment it would appear that the first patient had not sufficient sugar in reserve to raise her blood-sugar and thus prevent herself going into coma, whilst in the second case the sugar reserves were sufficiently adequate to prevent this result.

AN EXPLANATION

It is of more than theoretical interest to inquire further into this peculiar significance of the blood-sugar, and it is believed that the following considerations afford a logical explanation of the facts observed.

It must first be remembered that if the body is not using sufficient carbohydrate then ketone bodies accumulate in the organism and that by increasing the rate of carbohydrate utilisation this ketosis can be abolished. I have advanced the hypothesis [2] that the rate of utilisation of carbohydrates is determined by the product of the concentrations of insulin in the tissues and blood-sugar. It follows from this that the increase in blood-sugar which accompanies the restriction of insulin in diabetes is to be regarded, not as a pathological symptom in itself, but as a compensatory effort to maintain this product at a sufficiently high level.

In the case under consideration this compensatory effort had raised the blood-sugar to 250 mg. per 100 c.cm. before the beginning of the investigation. It must be assumed that this figure represents the maximum attainable with depleted reserves of glucose still available in the body, since the rate of carbohydrate utilisation remained too low to prevent the accumulation of ketones. Further elevation of the blood-sugar by administration of glucose, however, raised the value of the tissue-insulin-blood-sugar product, and as a result there was increased utilisation of carbohydrate and concomitant increased oxidation of ketones. Since the glucose reserves—i.e., glycogen—of the liver were depleted the increase in blood-sugar could not be maintained after cessation of absorption of glucose from the gut and with the fall in blood-sugar there was a return of ketonuria. I have

TABLE I

Time.	Blood-sugar mg./100 c.cm.	Expired air litres/min.	Urine. Volume. Total c.cm.	Volume. c.cm./½ hr.	Sugar. g./100 c.cm.	Sugar. g./½ hr.	Ketone bodies. mg./100 c.cm.	Ketone bodies. mg./½ hr.	Nitrogen. mg./100 c.cm.	Nitrogen. mg./½ hr.
A.M. 8.45	—	12·2	90	45	4·4	1·97	288	128	1510	675
9.00	250	—	—	—	—	—	—	—	—	—
9.15	50 g. of glucose given by mouth.									
9.30	308	11·0	—	—	—	—	—	—	—	—
10.10	—	9·4	—	—	—	—	—	—	—	—
10.15	406	—	—	—	—	—	—	—	—	—
10.30	—	12·0	—	—	—	—	—	—	—	—
10.40	448	—	121	32	7·4	2·34	208	66	924	293
11.00	480	9·5	—	—	—	—	—	—	—	—
11.15	—	—	69	69	8·7	6·05	48	33	376	260
11.25	454	9·5	—	—	—	—	—	—	—	—
11.45	—	—	66	66	8·62	5·64	31	20	435	284
12.00	—	8·9	—	—	—	—	—	—	—	—
P.M. 12.15	—	—	32	32	7·56	2·39	12	4	466	147
12.30	350	14·9	—	—	—	—	—	—	—	—
12.45	—	—	54	54	5·26	2·8	44	24	537	287
1.00	287	12·3	—	—	—	—	—	—	—	—
1.15	—	—	66	66	2·65	1·76	56	37	315	208
1.30	248	11·6	—	—	—	—	—	—	—	—

In the analyses of the urine both percentages and amounts are given, so that the complicating factor of diuresis may be allowed for.

obtained evidence (unpublished) that utilisation of carbohydrate involves depletion of tissue insulin; this fact, together with the manifest impossibility of raising the blood-sugar indefinitely prevents the administration of glucose alone from being an adequate therapeutic measure in diabetic intoxication. Nevertheless, accepting the suggestions (*a*) that ketosis can be abolished by increasing the rate of carbohydrate utilisation, and (*b*) that the rate depends on the product of the concentration of blood-sugar and tissue insulin, the considerations outlined above indicate clearly that the primary object in the treatment of diabetic intoxication should be to increase the available glucose so as to enable the residual insulin to exercise its effect. Thus, even if the concentration of insulin in the body is diminished, carbohydrate can still be utilised at an adequate rate, provided that the blood-sugar is maintained at a sufficiently high level by giving glucose.

A PRINCIPLE OF TREATMENT

The criticism may be made, why raise the blood-sugar when any required amount of insulin may be given? The answer lies in the results given below and in certain clinical observations.

Large amounts of insulin can be given intravenously to the patient in diabetic coma without producing hypoglycæmia, when to the same patient, after emergence from coma and after satisfactory balancing, very much smaller amounts would produce, in a relatively short space of time, hypoglycæmia shock. Insulin appears to be less active in states of diabetic intoxication than in their absence, and a consideration of the following results will demonstrate its apparently increasing activity. It has been suggested that this is a cumulative effect (Lawrence [3]), that insulin has to reach a certain concentration in the body before it can manifest its activity. Whatever the explanation, the observed result is that insulin is relatively inactive under these conditions, and it seems justifiable to attempt to secure the maximum effect from the diminished activity that insulin can manifest by *maintaining the blood-sugar at high levels*. This is the principle upon which the following treatment is based; give the maximum of sugar and the minimum of insulin, not conversely as is the present practice.

Management of the Case

The degree of intoxication affects the treatment only if, of necessity, it alters the route by which glucose must be given. The management of the straightforward case which can take sugar orally will first be described. This treatment is suitable for any patient who is still sufficiently conscious to swallow easily and nowadays it is uncommon to see a case that has progressed beyond this stage.

The patient is first put to bed and kept warm. Water is allowed freely and every three hours he is given 25 units of insulin subcutaneously, and 15 minutes later 50 g. of glucose in solution by mouth. Urine specimens are obtained just before each injection of insulin, catheterisation being necessary if the patient will not pass urine voluntarily. When first seen the urine will give a positive dark red ferric chloride reaction, which is usually accompanied by a copious white precipitate of phosphates; the more delicate nitroprusside reaction for acetone bodies will be positive and will become blue-black in colour on standing; and sugar will usually be present in sufficient amounts to reduce Benedict's qualitative solution completely. It may be said in passing that if it is thought that the ferric chloride reaction is positive and yet the nitroprusside reaction is found to be negative, then the patient is not suffering from diabetic intoxication, and the reddish colour given by the former reagent is due, not to aceto-acetic acid, but probably to some drug such as aspirin taken by the patient. As the patient comes under treatment the following sequence of urinary findings occurs in every case. First, the white precipitate given by ferric chloride either does not occur or comes down in very much diminished amounts. Second, the ferric chloride reaction becomes negative. Third, the nitroprusside reaction becomes negative. Fourth, the urine becomes sugar-free. Two typical cases are given in Tables II. and III.

TABLE II.—*Urine Specimens*

Time.	Sugar.	Ketone bodies.	
	Benedict's solution.	Nitroprusside.	Ferric chloride.
1.30 P.M.	4	++++	+++
4.30 „	4	++++	++
7.30 „	2	++	0
10.30 „	0	0	0
4.30 „	0	0	0
7.30 „	0	0	0
10.30 „	0	0	0

The patient was a little girl aged 12 years. On admission she complained of thirst, had a strong smell of acetone in the breath, and the tongue was dry.

N.B.—In these tables the degree of reduction of Benedict's solution is recorded as recommended by Harrison.[4]

TABLE III.—*Urine Specimens*

Time.	Sugar.	Ketone bodies.	
	Benedict's solution.	Nitroprusside.	Ferric chloride.
8.30 A.M.	4	++++	+++
11.30 A.M.	4	++++	+++
2.30 P.M.	4	+++	++
5.0 „	4	++	0
9.0 „	2	0	0
11.15 „	1	0	0

Patient was a boy aged 17. On admission he was thirsty, drowsy, respirations 22 per minute but not deep, slight degree of dehydration, the breath smelt strongly of acetone, and the mouth was dry.

As soon as the patient is passing urine which contains only a trace of sugar and no ketone bodies he should be put on a light diet of about a third of his normal calorific requirement. This should be made up almost exclusively of carbohydrate, divided into three main meals and insulin given so that every 3 g. of carbohydrate is covered by 1 unit. In addition, in between each, and three hours after the evening meal, 30 g. of glucose and 10 units of insulin should be given.

The scheme set out in Table IV. shows the type of diet used and the arrangement of the meals. The patient will remain acetone-free under this régime and after 24–48 hours the glucose, with its covering insulin, should be stopped and the diet increased so that every unit of insulin is covered by 4 g. of carbohydrate. If, prior to this, fat is included in the diet, even in small amounts ketones will again appear in the urine in considerable quantities. The final adjusting of the diet and insulin dosage may then be entered upon.

Recovery occurs with such automatic regularity that the minimum of supervision is required and the practitioner may to some extent consult his own convenience. Provided the treatment can be left in good hands, the patient need not be seen after the commencement of this oral method of treatment until 12 hours have elapsed. If then the urine is

found to contain sugar and to give a strong nitroprusside, but negative ferric chloride reaction, the patient may be left safely whilst another three doses of insulin and glucose are given. As soon, however, as the nitroprusside reaction is negative, and whilst the patient is on the initial light diet, he will require more careful watching. It must be remembered that after the ferric chloride reaction becomes negative the patient *cannot* go into diabetic coma, but that after the nitroprusside reaction becomes negative improvement may be so rapid that hypoglycæmic symptoms may occur. Instructions should, therefore, be left that on the advent of *any* untoward subjective symptoms glucose should be given freely, a urine specimen obtained, and the doctor informed. The improbability of this occurring, if reasonable care is exercised, can be seen from Table II., in which for over 12 hours after the urine was sugar-free glucose and insulin were given and yet hypoglycæmic symptoms did not result. Finally, it may be said that if the case is not severe and the practitioner's time is limited an equally good though less rapid result will be obtained if insulin and glucose are given four or even five-hourly from the commencement.

TABLE IV.—*Arrangement of Diet and Meals*

—	Carb.	Prot.	Fat.	Glucose.	Insulin.
8 A.M. *Breakfast.*					
Tea, with 1 oz. milk ..	1½	1	1		
2 oz. bread, toasted ..	30	2	—		
3 oz. apple or orange ..	6	—	—		
	37½	3	1	—	12½
10.30 A.M. *Glucose* 30 g...	..	..	..	30	10
1 P.M. *Dinner.*					
Egg on toast					
1 egg	—	6	5		
2 oz. bread, toasted..	30	2	—		
3 oz. orange	6	—	—		
	36	8	5	—	12
4 P.M. *Glucose* 30 g. ..	..	..	..	30	10
7 P.M. *Supper.*					
Sandwich—					
4 oz. tomato ..	3	1	—		
1½ oz. bread	22½	1½	—		
½ oz. butter	—	—	6½		
Tea with 1 oz. milk..	1½	1	1		
4 oz. apple or orange ..	8	—	—		
	35	3½	7½	—	12
11 P.M. *Glucose* 30 g. ..	..	..	..	30	10
Total diet ..	108½	14½	13½	90	—

Total calories from glucose and diet 970.

PATIENTS WHO VOMIT

To turn now to the cases that cannot take glucose solution by mouth. These are of two types, the patient in coma and the patient who, although conscious, vomits the solution.

To take the latter case first. The vomiting in this type of patient may result from one of two causes. It may be caused by the sweetness of the glucose solution itself or it may be a continuation of the severe vomiting which often ushers in an exacerbation of the diabetic condition. In either case an attempt should be made to give sugar by mouth, and there are many ways in which its cloying sweetness can be disguised.

At University College Hospital a stock solution is made up which contains 50 g. of glucose in 4 fl. oz. and which is flavoured by the addition of citric acid, essence of lemon, and, if desired, tincture of orange. The sweetness is well disguised if 4 oz. of this solution are diluted with soda water. This solution does not keep well and in practice it is of advantage to use Kia-ora lemon or orange squash, of which 4½ oz. contain 50 g. of sugar.

If vomiting persists then glucose must be introduced parenterally. The reasons against giving glucose by the stomach-tube or per rectum, and a simple technique for intravenous injection, have been described elsewhere.[4] When possible the intravenous method of treatment should be carried out, but if circumstances render this impossible and it is necessary to transport the patient to hospital the practitioner should give one pint of sterile 10 per cent. glucose in normal saline subcutaneously and an injection of 40 units of insulin. In this case the subcutaneous has an advantage over the intravenous method in that by this means the fluid need not be given slowly. If conditions are favourable 10 per cent. glucose in saline (glucose 60 g., sodium chloride 4 g. to the pint) should be given intravenously. One and three quarter pints (1 litre) containing 100 g. of glucose solution are run in *slowly*, 50 units of insulin being given subcutaneously at the commencement and another 50 units when half the solution has been given. At least an hour should be taken over this injection and the temperature of the solution should be 106° F. The patient is then left for three hours and it will then be found that the majority of cases will have improved so markedly that they will tolerate glucose solution by mouth. If not the treatment must be repeated. Such a case is shown in Table V.

TABLE V.—*Urine Findings*

Time.	Sugar.	Acetone.	
	Benedict's solution.	Nitroprusside.	Ferric chloride.
3.45 P.M.	4	++++	+++
5.45 ,,	4	++++	Trace.
8.30 ,,	4	++++	0
11.30 ,,	4	+++	0
2.30 A.M.	4	++	0
5.30 ,,	3	+	0
8.30 ,,	2	Trace.	0

The patient was a girl aged 17. Two hours before admission her doctor gave her 25 units of insulin and 50 g. of glucose, which she vomited. When seen the mouth was dry and the tongue cracked. Sordes had collected on the lips and teeth. There was a considerable degree of dehydration—the eye tension was diminished, the skin was inelastic, and the features looked sharp. The patient was drowsy and had been so for 24 hours. The breath smelt strongly of acetone and the respirations were 23 per minute and deep. The pulse was 128 and of small volume. The blood pressure was 103 mm. Frequent and severe vomiting had been occurring for two days. An intravenous injection was started at 4 o'clock and by 5.45 132 g. of glucose and 100 units of insulin had been given. The respirations were then 25 per minute but shallow, and the ferric chloride reaction had become practically negative in the urine. At 8.30 P.M. oral glucose and insulin were started successfully.

COMA

The treatment of comatose cases is but an extension of this latter method and has been detailed elsewhere.[4] 10 per cent. glucose in saline is given *slowly* intravenously until the patient shows unmistakeable signs of returning consciousness and then the oral method is started. In these cases, however, various points must be stressed. The weak heart of a case of diabetic coma apparently cannot cope with the rapid introduction of large amounts of fluid intravenously and fluid should not be run in faster than 1¾ pints (1 litre) in 1½ hours. This warning applies especially to those cases of coma of sudden onset which are not grossly dehydrated. A second point is, that when the intravenous method is used because of the more rapid introduction of glucose into the blood stream 1 g. of glucose is covered by 1 unit of insulin. As suggested above, insulin is given in 50-unit doses and it is advised that the first two or three injections be given intravenously. By this route the beneficial effect on the heart is often most marked. Thirdly,

it is suggested that for these very slow injections the temperature of the fluid in the reservoir should be even higher than previously recommended—namely, 110° F. rather than 106° F.

AN ILLUSTRATIVE CASE

By the courtesy of Dr. F. J. Poynton, I am permitted to cite the following case, which illustrates well the beneficial effect of intravenous injection of glucose.

The patient was a woman aged 35 years. At 4 A.M. she was noticed to be breathing very deeply and was complaining of abdominal pain. At 9.30 A.M. her doctor gave her 40 units of insulin and induced her to swallow 20 g. of glucose. Apparently the insulin showed its customary inactivity and the glucose was insufficient, for when seen at 11 A.M. she was much worse. She was pale, the pulse was 120 and weak. The breathing was deep and sighing and the only sign of consciousness was a weak swallowing reflex, and an occasional movement of the head. The tongue was dry and brown but there was no obvious dehydration. The urine contained large quantities of sugar and gave a strongly positive ferric chloride reaction. An attempt was made to give 40 g. of glucose by mouth, but as she attempted to vomit and it was feared that the sugar would not be absorbed, a slow intravenous injection of glucose was started and 20 units of insulin given. 100 g. of glucose had been injected by 1 P.M. and the patient had become sufficiently conscious to answer questions. The patient was then started on 50 g. of glucose orally and 25 units of insulin subcutaneously. By 4.30 P.M. the patient was fully conscious, and the urine, whilst containing much sugar, gave only a weak nitroprusside reaction. She felt comparatively well, and the only remaining sign of intoxication was a slightly increased respiration-rate. At 7.45 P.M. the respirations were normal and the urine contained only a trace of acetone. It will be seen that despite 40 units of insulin and a small amount of sugar the patient got worse, whilst when 20 units were given with a large amount of sugar the patient rapidly came out of coma. Incidentally, the blood-sugar, which was taken at 1.15 P.M., was 1200 mg. per 100 c.cm. of blood.

Conclusions

It may now be stated that in the last two and a half years 41 cases of varying degrees of diabetic intoxication have been treated at University College Hospital by the above method—26 being under my personal supervision—and the same steady and automatic recovery has occurred in each case. The treatment has also been used with excellent results in diabetics during acute infection and after operation, and it is further suggested that it would be of great benefit to the ill diabetic if he were first rendered acetone-free by the above treatment before he undertakes the trying journey from the country to the city hospital. Finally, it may be noted that when this method of giving glucose covered by insulin, and not insulin covered by glucose, is used, not only are blood-sugar estimations unnecessary, but, if performed, their significance is entirely fictitious.

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GUESSING COMPETITION FOR A HOSPITAL.—When it was announced recently that a guessing competition, with a motor-car and other prizes, had been organised for the benefit of the Royal Portsmouth Hospital, the Portsmouth Hospital Sunday Fund Committee decided to eliminate the hospital from its church collections unless the churches themselves earmarked their offerings for it. The decision, arrived at on the ground that the competition was "indistinguishable in principle from a sweepstake," was severely criticised, and the committee have now rescinded their resolution and restored the institution to the list of beneficiaries, while still protesting against the nature of the competition.

THE VALUE OF ENDOSCOPIC METHODS IN THE UPPER AIR PASSAGES*

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IN my opinion the value of bronchoscopy in diagnosis and treatment cannot be over-estimated. The general conception is that the bronchoscope is an instrument used for the removal of foreign bodies. If this were its only sphere of usefulness there would be little to say, because the number of bronchial foreign bodies met with in the average clinic is extremely small. To give an instance: at King's College Hospital a very large number of patients come to the throat department, yet in 1924 there was but one case of bronchial foreign body, in 1925 none at all, and in 1926 only one. Since those years much attention has been devoted to bronchoscopy at that hospital, with the result that by 1929 and 1930 the number of foreign bodies had increased to five a year, mainly because some cases were referred from other hospitals. Even so, the total number dealt with since 1924 has reached no more than 21, necessitating 25 bronchoscopic examinations. The amount of experience so derived would be quite inadequate to give sufficient practice for the efficient performance of the various bronchoscopic procedures; the 25 examinations form but a small proportion of a total of 365 performed for various reasons. Furthermore, greater practice is obtained from the numerous œsophageal examinations carried out in the clinic; inspection of the œsophagus is required much more frequently than examination of the bronchi. To confer the greatest benefit on the patient from bronchoscopic procedures, the laryngologist must be willing to devote a considerable amount of his time to the whole range of endoscopic methods, and must have a supply of patients suffering from diseases of the chest.

METHODS OF EXAMINATION

The teaching of Chevalier Jackson has given the greatest stimulus to the uses of bronchoscopy in the diagnosis and treatment of diseases of the lung and mediastinum. He has carried a step further the work of other pioneers and masters of the subject, and to him I owe a deep debt of gratitude. The observations recorded here and the successes obtained in some cases are due to following his methods, in the details of which some slight modifications—which appeared to confer advantages—have been made. As taught by him, local anæsthesia is used almost always. An injection of morphia, scopolamine, and atropine is given, followed by local anæsthetisation with a 10 per cent. solution of cocaine mixed with an equal quantity of adrenalin. Most patients after one or two experiences do not require any hypnotics, but atropine is generally helpful. If required, unconsciousness can be obtained by a dose of avertin, followed if necessary by a little chloroform; but this method is seldom employed.

The patient is examined lying down with his head and shoulders projecting over the end of the table, and supported by a mechanical head-rest (Fig. 1), made to my design by Messrs. Mayer and Phelps, elaborated from that of Haslinger; in this way the necessity for skilled assistants is eliminated. For examination of the larynx special instruments have been made for

* A paper read before the Harveian Society of London.

me by Mr. R. Schranz, of the Genito-Urinary Mfg. Co., Ltd.; they are of Chevalier Jackson's type, but have dual obliquely set lamps with lenses so designed as to throw a powerful light forward without any obstruction to the lumen of the tube. Jackson's bronchoscopes are used and, in general, a moderately small size is employed because of its added mobility in a bronchus. For examination in cases of new growth, and in certain other instances, a bronchoscope made by Mr. Schranz is particularly useful; it has a lens-fronted lamp only slightly recessed, whereby a good light is thrown well forward.

LARYNGOSCOPY AND TRACHEOSCOPY

Foreign bodies sometimes lodge in the larynx, and must be removed by the direct method, with the patient's body so tilted that if the impacted object be dislodged it will fall into the pharynx and not into the trachea.

A new field of utility for endoscopy is offered in cases of diphtheria; a method is now employed by which the air passages are kept clear of sloughs and thick secretions. The larynx is examined with a direct laryngoscope, and is cleaned with forceps or suction pump; it is said that tracheotomy or intubation is thus avoided in many cases.

New growths, such as papillomata, are removed in children through the laryngoscope, and many other direct examinations are made in the young, who do not tolerate indirect laryngoscopy well. In adults it is often desirable to inspect a suspected carcinoma by means of a direct laryngoscope, to determine its distribution and, if necessary, to take a small piece for microscopical examination.

Remarks applicable to the bronchi apply also to the trachea, but a few observations may be made concerning this particular region. Examination with a bronchoscope is sometimes required in patients with tracheostomy; granulations or ulceration caused by irritation of the distal end of the cannula may be discovered and treated, sometimes by painting with protargol. New growths of the trachea can be removed and several successful cases are reported.

FIG. 1

Head-rest for bronchoscopy: (1) adjustable cup to support head; (2) locking screw to adjust height of cup for head; (3) clamp to regulate distance of head-rest from table; (4) sterilisable arm with wheel to move head-rest up and down; (5) wheel to control lateral movements of head-rest; (6) adjustable padded support to control position of patient; (7) sterilisable quiver to hold bronchoscope, swab-holders, &c. (Made by Messrs. Mayer and Phelps.)

FIG. 2

Radiogram from patient with vertebra of rabbit in right lower lobe bronchus. There is opacity of the extreme base of the right lung, but the foreign body cannot be seen owing to the density of the surrounding lung tissue.

BRONCHOSCOPY

Foreign bodies.—The saving of life in this province is very great. Every foreign body entering by the larynx should be capable of removal through a bronchoscope. At King's College Hospital 21 patients have been dealt with since 1924; with one exception all were cured. Five cases were due to entry of a foreign body of vegetable nature, while 16 had non-vegetable objects, such as beads, pins, or teeth. In several instances previous attempts at removal had been made elsewhere. Of the vegetable substances, some made their appearance known by the severe symptoms and the physical and X ray signs; in two, however, these indications were absent, and the intruding object was only discovered by bronchoscopy.

Three cases caused by vegetable objects deserve special notice. In one an orange pip, in situ for a month, had almost killed a little girl aged 4½; she was desperately ill when the object was removed, without anæsthesia, within an hour of her arrival in hospital.

A girl of 5 had a history of a choking attack a month previously when eating peanut, but symptoms had been almost absent since then. Physical signs and X ray examinations did not indicate any foreign body, but because of slight evening rises of temperature it was decided to make a bronchoscopic examination. The complete half of a peanut, almost unchanged, was found in the left main bronchus; there were no subsequent ill-effects. The moral is that when in doubt a direct

bronchoscopic examination should be made.

One infant of 1½ years had fever and expectoration due to the inhalation of nut from milk chocolate; she was cured by a single bronchoscopy.

Of non-vegetable objects many were shown by X rays, but not all. For instance, a girl of 4½ was suspected of recurrent pneumonia for three months; she had on admission to King's College Hospital a temperature of 103·4° F., with a history of rigors, purulent sputum, and clubbed fingers. She was very dangerously ill, but the removal of a glass bead from the left lower lobe bronchus effected a cure.

Another interesting case was a man, aged 54, who had fœtid expectoration with loss of weight and fever; no foreign body was to be seen on X ray, but a complete vertebra of a rabbit was removed from his right bronchus. It had caused abscess of the lung and atelectasis of the lower lobe with such great opacity as to obscure the bony object (Fig. 2).

A small boy was suspected of whooping-cough, but was cured by removal of a metal screw. In three cases teeth had fallen down the trachea, one during tonsillectomy and two during dental extraction; in one case the dental surgeon promptly sought advice, and the object was removed within two hours of its entrance. In three instances the patient, after admission to hospital, spontaneously coughed up an object known to be in the lung, thus depriving those concerned of the pleasure of removing the foreign body.

The only case to end unsatisfactorily was a young man with an open safety-pin in the left lower lobe bronchus; previous attempts at extraction had been made elsewhere. When examined it was found that the point had penetrated the bronchial wall; after four unsuccessful attempts the pin—by constant friction against the pericardium—worked its way into the auricle and caused death.

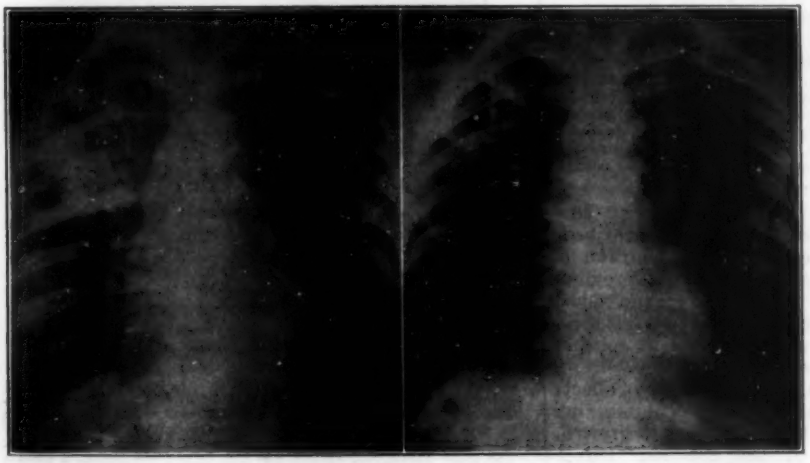
Lung abscess.—Of the 21 foreign bodies referred to, eight had caused formation of lung abscesses, some of three to four weeks' duration, one of three months, and one of 16 months; all were cured. The most resistant case was that due to the rabbit's vertebra; two bronchoscopies were required to remove the object, and nine more to drain the abscess. Three years have now passed, and the patient writes to say that he has been employed constantly as a painter on night work.

As the presence of a foreign body cannot be excluded without direct examination, it is obviously of the very greatest importance that bronchoscopy should be employed in all cases of lung abscess, if for no other reason. Another common cause of abscess is the performance of operations, particularly those in the mouth and pharynx. These are the cases generally alluded to in discussions on lung abscess; some unfortunately are treated by external drainage without a trial of endoscopic methods. The results obtained by bronchoscopy are so good that this method should be tried invariably, preferably in the early stages of the disease. No risk is taken in advising a patient to undertake this safe and comparatively painless form of examination; on the contrary, everything may be gained, as he may be restored to health without a prolonged illness and without an extensive operation.

FIGS. 4 A 4 B

Thicked-walled lung abscess in right middle lobe; aspiration on many occasions with considerable improvement: (A) shows the cavity full, and (B) shows it empty after bronchoscopic aspiration.

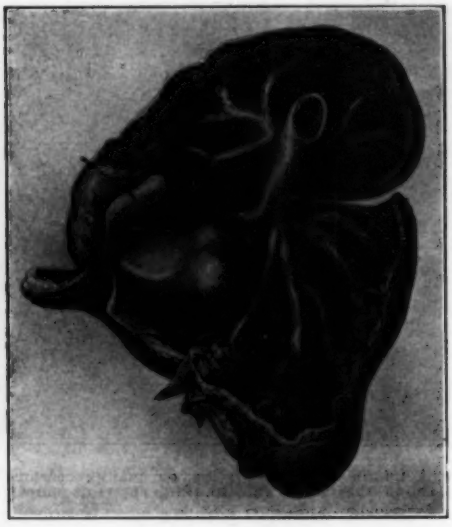
FIGS. 3 A 3 B



Radiograms of lung abscess, following dental extraction, in right upper lobe. They show the condition (A) before bronchoscopy, and (B) after aspiration; it will be seen that the lung has cleared.

Three patients who had undergone the extraction of 18, 20, and 25 teeth respectively, four weeks previously in two cases and two years in the third, were cured with ease (Figs. 3 A and 3 B). A man with gangrene of the lung following laryngectomy was put right by a single aspiration. In a fifth case a patient ill with fever of a hectic type following prostatectomy performed four weeks previously was put on the road to cure by a single bronchoscopy which cleared a bronchus plugged

FIG. 5



Drawing of abscess cavity in right middle lobe of which radiograms appear above (Fig. 4.) In an attempt to give greater improvement than was obtained by bronchoscopy artificial pneumothorax was performed, and subsequently thoracoplasty, after which the patient died. The drawing shows the lung in a condition of collapse with the cavity exposed.

with thick secretions. In a sixth case, treated eight months after tonsillectomy, improvement was obtained by six aspirations; the man was referred to a thoracic surgeon, who effected a complete cure by external drainage.

It is to be noted that in no case is bronchoscopic treatment continued if progress is not satisfactory, and if some alternative method, such as external drainage, can be recommended.

In post-pneumonic cases with lung abscess bronchoscopy is of considerable use, as exemplified by a man of 27, who had been seriously ill for four weeks and was cured by six treatments. He is now well and able to play tennis.

Several other cases of abscess with no very definite cause have been treated. Many have been of long standing, even up to 12 years, and therefore results are not too good; bronchoscopy, however, should be tried, as the result cannot be predicted, nor can the number of treatments be foreseen—one man attended on 34 occasions.

As an example, one man, aged 25, had suffered for a year from cough with foul sputum, attributed to an attack of influenza complicated by quinsy. His cough was so violent that he vomited after almost every meal. An abscess cavity was present in the left lower lobe; efficient drainage was obtained by bronchoscopic treatment repeated on eight occasions. He is now, six years later, very well, and is passed A1 as a naval reservist.

Several other cases have been improved considerably; in some, external operation has been necessary eventually, but even so the condition of the patient has been made better by the previous treatment, so that nothing has been lost and much gained (Figs. 4A and 4B and 5). In two instances the patient was dangerously ill and died in spite of treatment. In no case was any harm done.

The mechanism by which bronchoscopy effects improvement depends on narrowing or obstruction of the bronchial lumen by a foreign body, new growth, granulations, or swelling of the mucosa. Direct inspection enables the surgeon to remove or dilate obstructions, and to paint granulations with 10 per cent. solution of silver nitrate. A flexible suction tube is passed down into pus-containing cavities or bronchi, while the coughing of the patient brings pus from distant parts of the lung as far as the mouth of the aspirating bronchoscope, through which it is pumped away. During expiration, and more so during cough, there is normally a partial closing of the bronchi (Fig. 6); if the bronchial walls are swollen or thickened the lumen may be greatly diminished during the expiratory phase, and completely obliterated during cough. The more violent the cough the less likelihood is there of expulsion of pus. The bronchoscope, however, holds apart the walls of the narrowed bronchus and enables stagnant pus to escape, not only at the time but also subsequently, if a free lumen be re-established. It appears that lavage does more harm than good, and that the introduction of antiseptics is without benefit.

Bronchiectasis.—The results are not so excellent as in lung abscess; they are, however, sufficiently good to warrant a trial of bronchoscopy in every case. Of a series of 19 patients with multiple cavities, five have improved greatly, while four others have improved to an appreciable extent. In some cases division of the phrenic nerve has been employed as an additional method of treatment, with success. In this instance, as in very many others, the opinions of the physician and thoracic surgeon are required as to the requisite mode of treatment.

One man with right basal bronchiectasis is enabled to carry on his work as an insurance agent by attending at intervals for bronchoscopic aspiration. He has now had 34 treatments, a recent course being at fortnightly intervals. Seven patients were unchanged, some because of the long duration of their complaint, and two because treatment was unavoidably discontinued. Three children required general anæsthesia, and this probably acted as a factor in preventing improvement. Three patients died in spite of treatment, but none were made worse.

Bronchitis and asthma.—Sometimes a positive diagnosis cannot be made without endoscopic examination. I have been asked to examine patients suspected

FIG. 7

Carcinoma of right upper lobe obstructing the main bronchus. The radiogram shows intubation tube containing radon seeds in position. In this case there was much pus in the lower branches of the right bronchus because of lack of drainage. The tube containing radon was left in for one week, a lumen was established, and the condition of suppuration in the bronchi was very much improved. The shadow of the tube has been emphasised for purposes of reproduction.

of carcinoma of the lung, and have been able to exclude this possibility, finding simple bronchitis only. In widespread bronchitis and in asthma improvement may be obtained by bronchoscopy, but the benefits in these cases do not appear to justify this method of treatment.

From the diagnostic point of view, however, there is not practicable by this means unless the growth invades a bronchus, when radium might be introduced with amelioration of symptoms.

CONCLUSIONS

Examples have been taken from 95 patients of whom notes have been kept, in an attempt to

FIG. 6

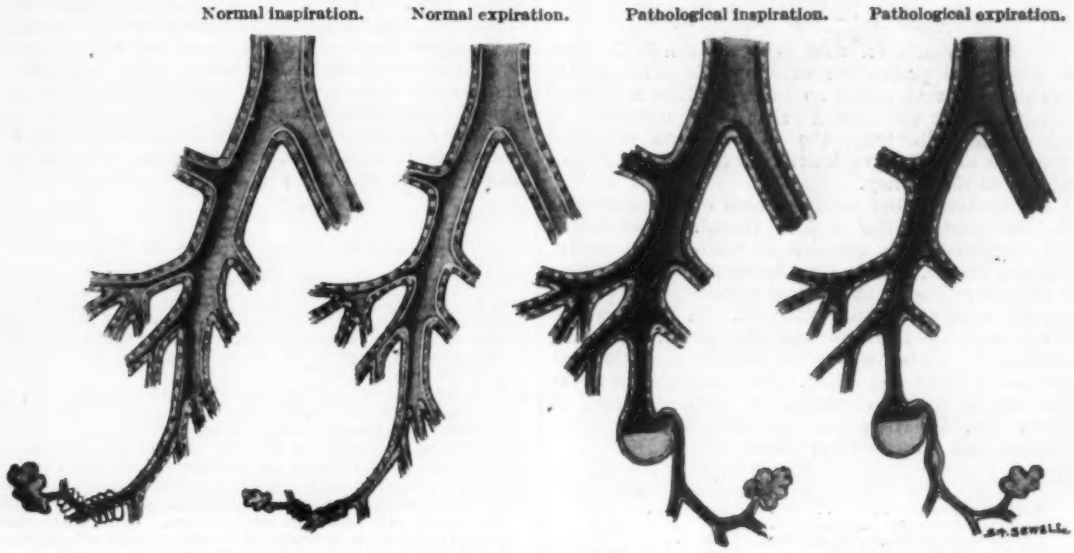


Diagram to show the changes of size in the bronchi and bronchioles during inspiration and expiration, the bronchiolar musculature being in a condition of contraction during the latter phase. The two drawings on the right show partial stenosis of the distal bronchi due to inflammation of the mucous membrane and the formation of granulation tissue. During expiration contraction of the muscular tissue brings the walls into apposition and prevents the escape of pus.

is wide scope for direct examination; swabs may be taken from different bronchi if required.

New growth.—In this field bronchoscopy is of great importance; if this method of examination be called for by physicians in early cases many good results should be obtained. One patient examined by me suffered from hæmoptysis, for which reason she stayed in a sanatorium for ten months. X ray examination showed obstruction to the left lower lobe bronchus, and the introduction of a tube revealed a smooth neoplasm almost completely filling the lumen. It was found to be a simple fibroma, and its complete removal was followed by cure. This case is one of several in which an attempt was made to discover the cause of hæmoptysis; a definite answer can be given in most instances.

Another satisfactory case was that of a man, aged 29, who had complete atelectasis of the right lung. This was due to blockage of the main bronchus by a pedunculated adeno-carcinoma, which was removed. When heard of three years later he was perfectly well. Other patients with advanced carcinoma of the lung suffer from the mechanical effects of blocking of a bronchus by growth. Removal of part of the latter by means of biting forceps, or by the introduction of an intubation tube (Fig. 7) containing radon—similar to that of Tudor Edwards—may lead to aeration of the lung and drainage of secretions. In certain instances abscess of the lung is produced in a distal bronchus; relief of the symptoms by bronchoscopy makes the lives of the patients far more bearable.

There are many examples where pressure is exerted on a bronchus by mediastinal new growth; a diagnosis can be made through the bronchoscope, but treatment illustrate the great value of endoscopic methods applied to the air passages. It is satisfying to know that at least 28 patients subject to most dangerous complaints have been cured, while none have been harmed. Of the remainder, 26 have been improved, some to a very marked extent; 11 were unchanged. In 21 a diagnosis was called for and made. Six patients died in spite of treatment.

Of 72 patients for whom bronchoscopy was used as a means of treatment, and not merely for diagnosis, a total of 28 cured and 26 improved is gratifying, considering the variety and unpromising nature of many of the conditions.

LEASOWE HOSPITAL. — At the annual meeting of the Liverpool Open-air Hospital for Children, at Leasowe, Cheshire, it was stated that a ward had been closed in consequence of the "amazing drop" in the number of children sent from Liverpool. Eighteen months ago 147 beds were occupied by Liverpool children; now there are only 61. The cost of maintenance was about £2 2s. per patient per week.

MANCHESTER BABIES' HOSPITAL. — The report of this hospital for the year ending March 31st, 1932, shows that there were 604 admissions, an increase of more than 10 per cent., and 84 deaths, 14 of which took place within 48 hours of admission. The average stay was 54·89 days and of fatal cases 22·77 days. The analysis of discharges gives the largest number of cases, 122, to chronic dyspepsia, which caused nine deaths. The period of training for probationers, who are now admitted at 17, has been increased from two to three years; all the hospital's candidates during the year were successful. A post-graduate course of lectures at the hospital is included in the Manchester University syllabus for 1932–33.

EXPERIMENTAL PRODUCTION OF KIDNEY LESIONS BY DIET

BY W. CRAMER, D.Sc. EDIN., PH.D. BERLIN, M.R.C.S. ENG.

(From the Imperial Cancer Research Fund)

(WITH ILLUSTRATIVE PLATE)

IN experiments on rats kept on synthetic diets in which the proportion of inorganic salts in the salt mixture was varied so as to produce a mineral imbalance, it was found that the omission of magnesium salts from the salt mixture produced extensive degenerative lesions in the glomeruli and tubules of the kidney.

The synthetic diet used in these experiments was the one used in the routine vitamin experiments, and consisted of a mixture of white light casein, wheaten starch, fat, and an inorganic salt mixture. In some experiments the fat was cod-liver oil (0·5 c.cm. per rat) with or without olive oil. In these experiments a little marmite was also given. In other experiments butter was given as fat, and then no marmite or yeast was added. The composition of the diet was as follows: casein, 20 parts; starch, 75 parts; fat, 5 parts; salt mixture, 5 parts. Two different salt mixtures were used:—

	I. grammes.	II. grammes.
Sodium chloride	6·9	5·2
Sodium dihydrogen phosphate	13·9	10·4
Dipotassium hydrogen phosphate	38·2	28·6
Calcium phosphate diacid	21·6	16·2
Calcium lactate	52·0	39·0
Ferric citrate	4·7	3·5
Potassium iodide	—	0·1
Manganese sulphate	—	0·5

An analysis of this diet, for which I am indebted to my colleague Mr. M. G. Crabtree, gave 0·632 mg. magnesium in 100 g. of diet. In the control experiments magnesium sulphate was added to the salt mixture in the following amounts:—

To salt mixture I. .. .. .. 10·6 grammes.
" " " II. .. .. .. 8·0 "

No attempt was made to purify the diet so as to remove every trace of magnesium from the diet because the original object of these experiments was to study the effect of disproportions of certain inorganic salts on the growth of tumours, and it was essential for such experiments to maintain the animals in good health over a long period. This appeared to have been accomplished, for the animals grew as well, and looked as well on the diet containing the magnesium-free salt mixture as on the control diet for at least six weeks, and when killed were in as good a state of nutrition. Their temperature was normal, and all the organs appeared normal, except the kidneys. These showed a puckered surface, were frequently enlarged, and sometimes showed a grey mottling. On section there was a definite marked striation at the junction of the medulla and cortex. Microscopically there is an extensive degeneration of tubules and glomeruli, which is most marked at the junction of cortex and medulla, but extends far into the cortex. These degenerative changes are sometimes, but not always, accompanied by calcareous deposits in the tubules and glomeruli, but when these are found they are restricted almost entirely to the junction between cortex and medulla. They are not seen, as a rule, in the degenerated tubules and glomeruli situated in the more peripheral parts of the cortex. Sometimes a definite increase in the connective tissue around the degenerated tubules has been observed, but there is no evidence of an inflammatory reaction. The general appearances of these changes are given in Figs. II.–VI. on Plate.

By keeping three or more rats in metabolism cages overnight without any food, and collecting the urine, it was possible to obtain sufficient urine to test for the presence of albumin by heating with the addition of acetic acid. Albumin was found in considerable amounts in the urine of rats after four to five weeks on the magnesium-free salt mixture, while the urine of control rats contained no albumin, or only traces. The results of such tests in two different series are given in the Table below.

These experiments have now been carried out for more than 12 months on over 200 rats, including the animals kept on the control diet. Mainly young rats weighing 50–70 g. at the beginning of the experiment were used. In every rat kept for five weeks or longer on the diets given above, extensive degenerative lesions were found if the salt mixture did not contain magnesium salts. On the control diet the kidneys also showed a certain amount of degenerative lesions in about half the number of animals, but these lesions were much more restricted in extent and were limited to the junction between cortex and medulla. They consisted, moreover, almost entirely of calcification taking place in tubules. For this reason the publication of these findings has been delayed, since there seems to be yet a second factor—apart from the presence or absence of magnesium in the salt mixture—which in experiments with a synthetic diet can induce degenerative changes although of a different kind and to a much more limited extent, and it was considered necessary to determine the nature of this second factor.

LEGENDS TO ILLUSTRATIONS ON PLATE

DR. CRAMER

FIG. I.—Kidney of control rat kept for 31 days on synthetic diet containing butter but no cod-liver oil. Magnesium salt added to salt mixture. Section through whole thickness of cortex to show complete absence of calcification. (× 50.)

FIG. II.—Kidney of rat kept for 31 days on same diet but no magnesium salt added to salt mixture. Extensive degeneration through whole thickness of cortex. (× 50.)

FIG. III.—Same kidney as Fig. II. Higher power to show degeneration of tubules and glomeruli. (× 150.)

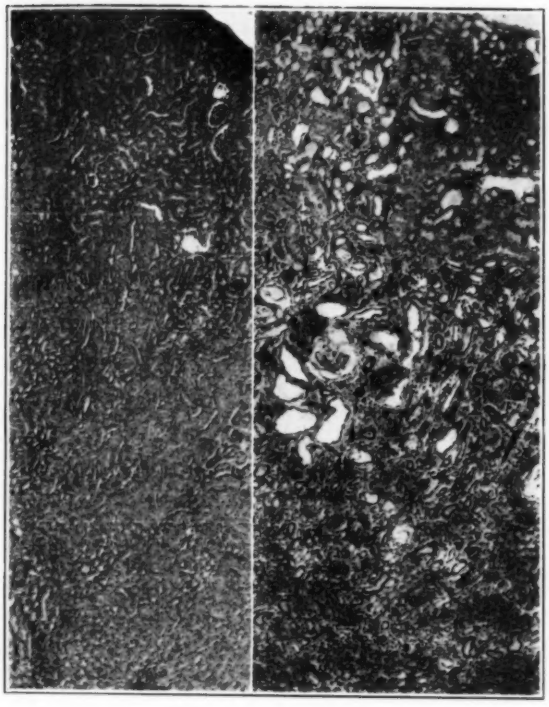
FIG. IV.—Kidney of control rat kept for 66 days on synthetic diet containing cod-liver oil (0·5 c.cm. per rat per day). Magnesium salt added to salt mixture. Section through whole thickness of cortex to show narrow zone of calcification at junction of medulla and cortex. (× 100.)

FIG. V.—Kidney of rat kept for 66 days on the same diet, but no magnesium salt added to salt mixture. Extensive degenerative changes in tubules and glomeruli throughout whole thickness of cortex. (× 100.)

FIG. VI.—Kidney of rat kept for 21 days on synthetic diet containing cod-liver oil. No magnesium salt added to salt mixture. Degeneration of tubules and calcification in glomeruli in outermost layer of cortex. (× 175.)

Weeks ..	1	2	3	4	5	6	Average weight of kidney.
No magnesium in salt mixture	−	−	+	++	++		1·49
Control ..	−	−	−	−	Trace		1·09
No magnesium in salt mixture	−	−	+	++	++	+++	1·69
Control ..	−	−	−	−	Trace	−	1·39

FIGS. I II



FIGS. IV V

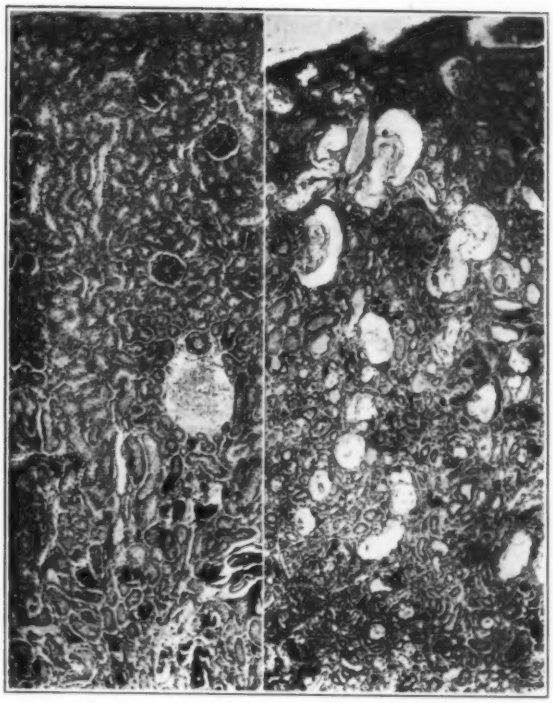


FIG. III

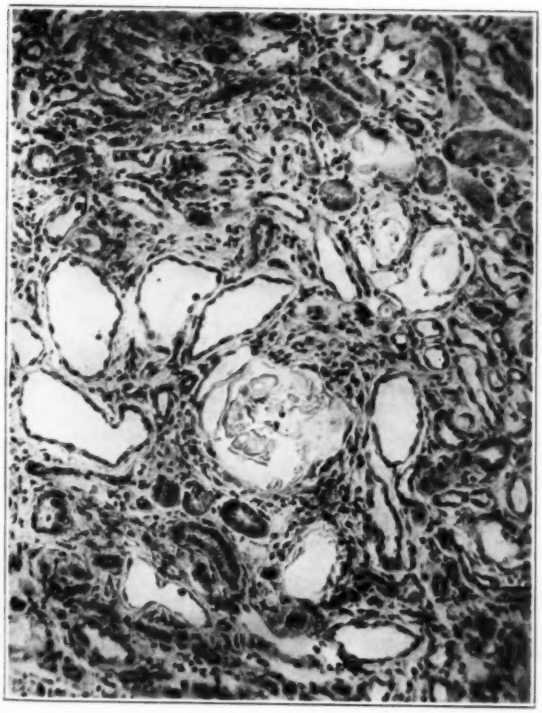
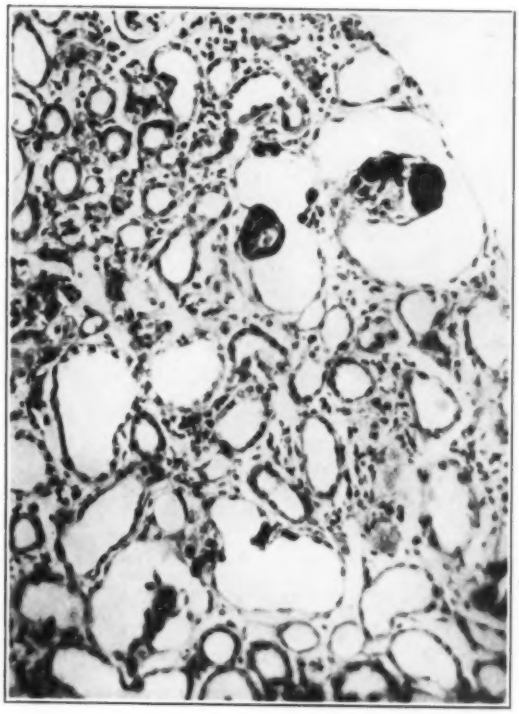


FIG. VI



DR. CRAMER: EXPERIMENTAL PRODUCTION OF KIDNEY LESIONS BY DIET

FIG. I

FIG. II

FIG. III

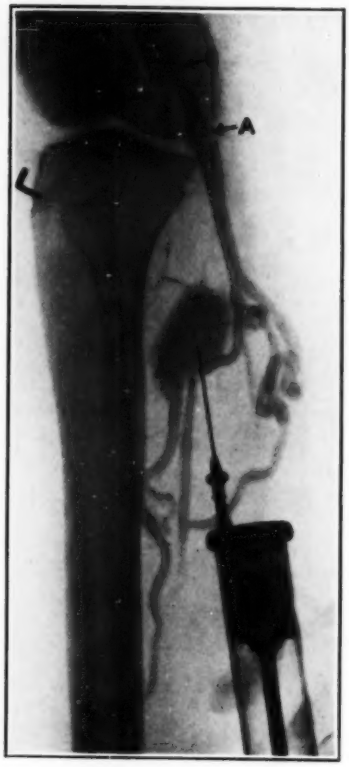


FIG. IV

FIG. V

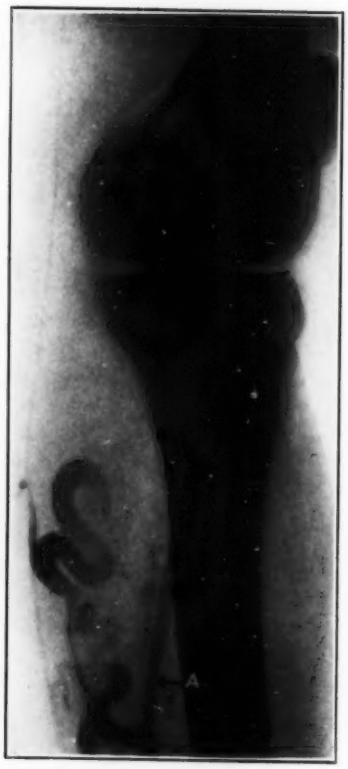


FIG. VI

DRS. BARBER AND ORLEY: VARICOSE DISEASE OF THE LEG

The diet was changed in a variety of ways, which need not be detailed here, in order to eliminate the occurrence of this limited process of calcification in the control series. This, however, has not yet been possible except in one series. Since in most of the experiments carried out so far cod-liver oil was added as a source of vitamin A, it seemed possible that these degenerative changes associated with calcification found in the control series might be due to the presence of vitamin D in the cod-liver oil, although the amount of cod-liver oil given in these experiments (0·5 c.cm. per rat) has hitherto not been considered to be excessive. For this reason, a series of experiments was carried out in which butter was substituted for cod-liver oil. In this series the kidney changes were absent in the control animals receiving magnesium salts in their diet, while the animals on the diet without magnesium salts showed again extensive degenerative changes. These experiments on the nature of the second factor are being continued.

LEGENDS TO ILLUSTRATIONS ON PLATE

DRS. BARBER AND ORLEY

FIG. I.—Normal vein.

FIG. II.—Retrograde flow. Very large ampullar dilatation (*a*) at level of knee-joint. Deep vein (*b*) filled through an anastomotic branch above ankle.

FIG. III.—Retrograde filling of superficial veins. Ampullar dilatation (*a*) at level of knee-joint. Partial filling of deep vein (*b*) through an anastomotic branch (*c*) at level of knee-joint. Note extravasated abrodil in surrounding perivenous tissue, with needle still in the vein.

FIG. IV.—Filling of deep veins (*c*) through anastomotic branches above ankle (*a*) and at level of knee-joint (*b*).

FIG. V.—Filling of deep veins (*a*) through anastomotic branches at lower third of leg.

FIG. VI.—Same leg as in Fig. V. after muscular contraction.

The reason for the publication of these observations at the present stage is the appearance of a paper by Kruse, Orent, and McCallum,[1] who kept rats on a diet which had been carefully purified so as to contain only minimal traces of magnesium—0·018 mg. per 100 g.—i.e., about 40 times less than the diet used in my experiments. On such a diet the rats begin to show changes in the skin (vasodilatation and hyperæmia) as early as the third to fifth day. Later, between the eighteenth and twenty-third day, the animals are attacked by sudden violent convulsions and develop other marked pathological conditions. In our experiments the animals, as already stated, remained normal in their outward appearance, growth, and nutritive conditions, and the kidney appears to be selectively affected, in contrast with the more general pathological lesions observed by McCallum and his collaborators on a diet completely deprived of magnesium.

CLINICAL SIGNIFICANCE

Our experiments were carried out with the original intention of studying the biological effect of a mineral imbalance between magnesium and calcium ions, since it is known from other evidence that there is a biological antagonism between these two ions. It was expected that the diminution in the intake of magnesium ions would lead to a preponderant effect of the calcium ions and would produce a more extensive calcification of the kidney. This, however, did not occur. The extensive degenerative changes in the tubules and glomeruli, which were found instead, are surprising and unexpected. The theoretical significance of these observations lies in the fact that it is possible to produce experimentally such degenerative changes by dietetic measures which do not involve the introduction or formation of toxic substances, but which appear to result from a mineral imbalance, having a specific effect on the glomeruli and tubules of the kidney. It is of interest to note that clinically the administration of large amounts of a magnesium sulphate solution has been used in recent years with good results in the hæmorrhagic nephritis of children in order to ward off uræmic convulsions or to cut them short when they have set in.[2 3 4] In the former case large quantities (from 1 to 2 ounces of a 50 per cent. magnesium sulphate solution) have to be given by the mouth or per rectum every four hours. In comatose patients or in those with convulsive twitchings the action is not sufficiently rapid and the intramuscular injection of a 25 per cent. magnesium sulphate solution in doses of about 0·2 c.cm. per kg. body-weight is recommended. The administration of magnesium sulphate produces a fall of blood pressure and cessation of cerebral symptoms. It is a curious fact that even such massive doses of magnesium sulphate do not produce diarrhœa in children with the hæmorrhagic type of nephritis. Blackfan and McKhann [3] admit that the mechanism of the action of magnesium sulphate in the dosage used is not clear. The observations recorded in this paper appear to suggest an explanation and to warrant a more extensive use of magnesium sulphate in the treatment of certain types of nephritis.

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SOME X RAY OBSERVATIONS IN VARICOSE DISEASE OF THE LEG

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AND

ALEXANDER ORLEY, M.D. GENEVA, D.M.R.E. CAMB.

(WITH ILLUSTRATIVE PLATE)

UNTIL the recent discovery of Uroselectan and Abrodil, massive injections into the general circulation of substances opaque to X rays were not considered safe. These substances, particularly abrodil, have, however, proved safe and helpful in examining varicose conditions of the leg in the living.

Most of the previous work on this subject has been done by observing injected radio-opaque substances by means of the fluorescent screen or by ordinary skiagrams. Obviously, by either of these methods the projection of the shadows of the injected vessels is obtained in one plane only. It is therefore impossible to judge from the radiographic or radioscopic image the position of the injected vessels in space, and it is impossible to tell whether a particular branch is superficial or deep (directed towards the deep veins). This difficulty can be overcome by taking

stereoscopic radiograms of the leg during the injection of the opaque substance.

This paper relates the results of this method applied to thirty consecutive cases and represents the summary of our study of:—

(1) The rate and direction of the venous blood stream in (*a*) normal, (*b*) varicose conditions, and

(2) The anatomy, physiology, and pathology of the veins of the leg and of their valves in (*a*) normal, (*b*) varicose conditions.

All cases were studied under similar conditions of position of patient and of X ray technique, except when otherwise indicated.

RADIOGRAPHIC TECHNIQUE

Our X ray table has a double top with a space between, so that an X ray cassette may be pushed under any part of the patient without disturbing his position. Two 15 in. by 6 in. cassettes are used and 20 c.cm. of a 10 per cent. solution of abrodil is required. When the tube has been centred over the part to be examined and the cassette placed in position, the tube is shifted 3·5 cm. to the left. Ten c.cm. of abrodil are injected, and the first picture is taken without withdrawing the needle. The first cassette is then replaced by the second and the tube moved 3·5 cm. to the right of its original central position. The remaining 10 c.cm. of abrodil are given and the second film is exposed. In this way the two 15 in. by 6 in. films are exposed in the correct position for stereoscopic examination. Double-coated films and intensifying screens were used, 70 cm. focus-film distance, 100 milliamperes at 65 kilovolts and an exposure of one-fifth of a second.

Both uroselectan and abrodil have been used for injection into the veins and no difference in the contrast was found, but the uroselectan solution takes rather a long time to prepare, whereas abrodil is supplied in solution ready for use. Further, abrodil is relatively harmless should it leak into the subcutaneous tissue. It causes a transitory sensation of burning which soon disappears and is followed by no ill-effects.

RESULTS

In the normal case (Fig. I. on Plate) the injected opaque fluid ascended the internal saphenous vein. Its back-flow was stopped by the nearest valve below the point of the injection. Several superficial branches of the injected vein were filled by the opaque fluid but none of the fluid passed into the deep circulation through the venæ comites or through the perforating veins. With the fluorescent screen the fluid was seen disappearing gradually from the saphenous vein and the superficial branches by passing into the general circulation. It was therefore concluded that, in the normal subject in the horizontal position with the leg at rest, there was no flow from the superficial into the deep circulation.

In varicose veins (Figs. II.–VI.), with the leg in the horizontal position, the fluid flowed both distally and proximally but chiefly distally. In the upright position the flow was downwards only. When the patient stood firmly on the foot and pressed hard upon it, the opaque fluid either stopped descending or ascended slightly. In the horizontal position the rapidity of the blood stream in varicose veins varied according to the muscular activity of the leg. The flow was slow and regular during rest; under the influence of muscular contractions the opaque fluid broke up quickly and passed into the general circulation, but some of it still remained in the vein at the level of its ampullary dilatations. In the diseased, as in the normal veins there was no communication between the superficial and deep circulation through the venæ comites. Although varicose veins give off branches towards the deep veins, the opaque fluid penetrated for a short distance only along these branches (up to the deep aponeurosis?) and then stopped suddenly. In a few cases the fluid penetrated into the deep circulation through the anastomotic branches of the internal or external saphenous veins at the level of the ankle and the knee-joint. We have not been able to decide whether there is flow from the deep into the superficial circulation, because we have had no opportunity of injecting the opaque fluid directly into a deep vein.

Some ampullæ have a constant position (at the level of the knee-joint) and probably correspond to a valve which has become incompetent. The largest ampulla observed at this level was the size of a pigeon's egg.

SUMMARY

(1) The normal internal saphenous vein showed a slight dilatation at the level of the internal condyle of the tibia, corresponding with a constant valve in this situation. In varicose veins large ampullary dilatations were occasionally seen at this level.

(2) In normal veins the fluid flowed towards the heart. Its back-flow was stopped by the first valve below the site of injection; in varicose veins the flow was both forward and backward. The backward flow was due to incompetence of the valves.

(3) In the normal vein none of the solution was seen to enter the deep circulation of the leg through communicating or anastomotic vessels. In a few cases of varicose veins the opaque fluid was seen to penetrate into the deep circulation through anastomotic vessels at the level of the ankle and the knee-joint, but never through the venæ comites.

(4) The rate of the flow in both normal and pathological cases was influenced by posture, rest, muscular activity, and respiration.

(5) Radiography of the veins may be of considerable assistance in cases which do not respond to the usual injection treatment.

IMMUNISATION WITH POTENT UNCONCENTRATED DIPHTHERIA TOXOID

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AND

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PROBABLY at any time since toxoid was first used it would have been agreed by those interested in this work that toxoid—in some form or other—promised to be the best immunising agent for human work if its propensity to cause reactions could be overcome. As Harrison (1932) says, "the only obstacle in the way of the universal use of toxoid is the tendency to cause local and general reaction in older children."

Formol toxoid for human use was made at the Wellcome Physiological Research Laboratories in 1924; it caused no reactions in young children and gave good immunity but caused troublesome reactions in a few adults. The difficulty was avoided by making T.A.F., toxoid antitoxin floccules; this prophylactic, while giving at least as good immunity as any formol toxoid in general use—it gave better in some com-

parative observations on small numbers of adolescents—is almost entirely free of reaction-causing properties. Thus, we have immunised the entrant nurses in a large general hospital for several years without causing troublesome local or general reaction except in two nurses, and 1700 immunisations in adolescents are recorded with only two mild general reactions. T.A.F. is, however, more difficult to prepare than toxoid and more costly.

Moloney and Fraser (1927) devised a procedure, now widely used in Canada and the U.S.A., by which much of the trouble liable to be caused by the injection of toxoid into sensitive subjects can be avoided. If one injects, intradermally, at the same time as the Schick test is done, a very small amount of toxoid, the children that are likely to suffer troublesome local or general reactions during immunisation reveal themselves in advance by developing a local reaction in this preliminary intradermal "toxoid reaction" test. (For convenience we call this the "Moloney test" and the reactors "M-positive.") FitzGerald and co-workers (1932) found 16 per cent. of reactors in 30,000 children and 10 per cent. of reactors between the ages of 5 and 14 with "3 +" reactions"; they either immunise these "M reactors" by a series of reduced doses of toxoid or leave them without active immunisation. (These authors point out that a certain number are already immune.)

We have had at our disposal toxoids of unusually high value (28 to 36 Lf). Pope (1931) made toxin with an Lf value of 50, and has since (private communication) reached 65 Lf; the toxoids used by Ramon and in the Canadian work, have ranged from about 7 to 15 Lf. We were interested to see (1) if our more potent toxoids were any more liable to cause reactions, (2) whether Moloney and Fraser's method of detecting "sensitive" subjects would apply satisfactorily to these potent toxoids, and (3) whether the same unusually rapid and high immunity, described by Glenny in animals, would occur in human beings.

REACTIONS TO "TOXOID TEST"

Some of our results are summarised in Table I. Five per cent. of 906 subjects aged 1–28 showed "definite" reactions, and 12·7 per cent. "mild."

TABLE I

Group.	Numbers.	Ages.	Reaction.		
			Nil or faint.	Mild.	Definite.
A	18	under 3	18	0	0
B	244	3–15	211	23	10
C	204	6–15	170	27	7
D	141	1–18	127	12	2
E	197	11–18	148	37	12
F	102	19–28	72	16	14*
Total	906	—	746 (82·3%)	115 (12·7%)	45 (5%)

* 9 of these 14 were Schick-negative.

"Definite" indicates a central zone of redness with a palpable thickening of the skin 15 to 35 mm. wide; this is surrounded by a flushed zone, varying from an easily delimited area 40–120 mm. to a faint flush 10–15 cm. wide, merging into the colour of the surrounding skin. A few subjects complained of troublesome irritation but none of loss of sleep.

"Mild" indicates a faint red flush 25–100 mm. wide. Some of these were immunised with toxoid, without suffering reactions. Twenty-five of the "mild" and "definite" reactors were immunised with three doses of 1·0 c.cm. of T.A.F. at fortnightly intervals; none suffered any reaction. A few "definite" reactors received toxoid; all suffered a local or general reaction. None with "nil or faint" suffered from troublesome symptoms, either local or general, after the injection of toxoid.

So far as our small figures go, there is no "sensitisation" by the intramuscular injection of the three immunising doses of toxoid; no children who showed "nil" M reaction before immunisation gave "mild" or "definite" M reaction afterwards.

IMMUNITY PRODUCED

We picked out 12 children of group C who had given a very strong Schick-positive reaction; they were Schick-tested again four and a half weeks after the first injection of toxoid—i.e., within one week of the third fortnightly injection of 1·0 c.cm. of toxoid. Seven of the 12 were completely negative. In one small group of 68 children who received only 1·5 c.cm. of toxoid in all, and were tested one week after the last injection, 32 had already become Schick-negative. This was encouraging. The results of some further tests on small groups in different institutions are given in Table II.; all received three injections of 1 c.cm., mostly at fortnightly intervals. (We never saw, at the second Schick test after immunisation, the vivid positive reactions so often met with after the initial Schick test, but we naturally recorded all "faint" or "doubtful" reactions as "positive.") Though the numbers are small—for our clinical opportunities for this type of work are unfortunately limited—this toxoid appears to give high immunity.

TABLE II.—*Immunisation with Potent Unconcentrated Diphtheria Toxoid*

Weeks after final injection.	No. immunised.	No. Shick negative.	Per cent. negative.
4	96 (44)	91	95
2	33 (85)	31	94
2	65 (48)	63	97
3	28 (20)	26	93
3	26 (90)	25	96
Summary 2–4	248	236	95

Figures in parentheses represent the percentage found Schick-positive in each group when first tested.

SUMMARY

From these preliminary results it is probable that the answers to our inquiries will be favourable. (1) Unconcentrated toxoids with an Lf value of 28–36 are probably not more liable to cause reactions than those of half or one-third this strength in wide use in the world. (2) Subjects who react to the Canadian "toxoid intradermic test" are liable to suffer troublesome local or general reactions if given three full doses of 1 c.cm. of toxoid, but can in nearly every instance be immunised without trouble by three full doses of toxoid-antitoxin floccules. (3) Rapid immunisation follows the injection of three fortnightly doses of 1 c.cm. of potent toxoid.

Note.—Jensen (1931) has used concentrated toxoid containing 150 Lf per c.cm. and upwards. Our colleagues Mr. Pope and Miss Llewellyn-Smith have recently prepared concentrated toxoid of similar high value; it will be of interest to find whether any liability to cause reaction can be circumvented by the use of the Moloney test.

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A CASE OF ADDISON'S DISEASE

SUCCESSFULLY TREATED BY CORTICAL SUPRARENAL EXTRACT

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RECOVERY from severe Addisonian crisis and good health one year later is of sufficient interest to be recorded. The outlook in Addisonian crisis has always been considered to be of the utmost gravity, most patients succumbing to the extreme fall of blood pressure, dehydration, and fall in blood volume. In the past temporary improvement has sometimes resulted from administration of glucose and saline intravenously, adrenaline subcutaneously to the limit of tolerance, and stimulants, but relapses have been frequent. The isolation by Swingle and Pfiffner of a substance which prolongs the lives of suprarenal-ectomised cats indefinitely seems likely to make as much difference in prognosis in Addisonian crisis as did the isolation of insulin in diabetic coma. With the introduction of insulin as a therapeutic agent in diabetic coma, it was soon recognised that glucose and saline intravenously were very important in combating ketosis and dehydration; similarly, in Addisonian crisis glucose and saline are still essential in attempting to get rid of the grave, shock-like condition. The patient described below recovered from an Addisonian crisis in a dramatic manner, which can only be compared to recovery from diabetic coma with insulin.

CASE NOTES

The patient, a married woman aged 43, was admitted to the London Hospital on June 29th, 1931, complaining of increasing pigmentation of the skin and general weakness.

Two years previously she had general "rheumatic" pains, without swelling of joints or involvement of the heart, and at this time she first noticed that her skin was becoming darker. Previously a very big woman, she steadily lost weight (about 6 st. in two years), and her appetite became poor. There was no abdominal pain or cough, but her menstruation had ceased some six years before the onset of the symptoms. Her past health had been good, her husband and two children were alive and well, and there was no family history of tuberculosis.

When first examined the patient was extremely wasted, weighing 7 st., and looked much older than her age. There was dark brown pigmentation of her skin, most marked in exposed parts, axillæ, breasts, and parts pressed on by her clothing. Much darker macules were visible in the uniform brown pigmentation. The lips, buccal mucosa and dorsum and side of tongue were deeply pigmented. The pulse was of very poor volume, 70 per minute, and the blood pressure 92/55 mm. Hg.

There was no clinical evidence of pulmonary tuberculosis, and examination of the abdomen and central nervous system was negative. The blood Wassermann reaction was negative and a blood count showed 5,000,000 red cells per c.mm. Hæmoglobin 75 per cent., colour-index 0·75, and 6200 leucocytes per c.mm. Differential count: polymuclear neutrophils 49·5 per cent., eosinophils 3 per cent., small lymphocytes 32 per cent., large lymphocytes 8 per cent., large hyaline cells 7 per cent., and coarsely granular basophil cells 0·5 per cent. The urine contained a cloud of albumin. The blood-sugar was 0·087 per cent. A radiogram of the chest showed a few calcified nodules up to 0·4 cm. diameter and Dr. G. E. Vilvandré reported that no calcification of the suprarenals was visible.

Three days after admission the patient vomited twice after lunch and next day the blood pressure was 68/50 mm. Hg. Next day she was definitely worse, continued vomiting, and was light-headed and irritable. The blood pressure was now 65/45 mm. Hg. It was decided to give 240 c.cm. of 10 per cent. glucose in saline intravenously with adrenaline ℥v. and slight transitory improvement followed; but in spite of further treatment with strychnine, adrenaline, and rectal salines, the patient was semi-conscious and almost moribund by July 6th, and treatment with cortical extract was now begun.

At 1.50 P.M. 600 c.cm. of 5 per cent. glucose in saline with 50 c.cm. of cortical extract (Eucortone) was given intravenously, about 20 minutes being occupied in the injection. At 3.25 P.M. the patient had a rigor and became unconscious for an hour. The breathing was stertorous, the pupils were small and fixed, and the blood pressure 80/65 mm. Hg. Next day 10 c.cm. of cortical extract were given night and morning and in the evening the patient had lucid intervals during which she talked. On the morning of the eighth she was much better and asked for breakfast. Ten c.cm. of cortical extract were given twice daily on this and the following day. Her skin was already paler and the pigmentation continued to fade. After the 9th 10 c.cm. were given daily, and on July 21st the patient got up for the first time, 15 days after the beginning of treatment with cortical extract, and having a better appetite than for months past

On August 2nd the dose was reduced to 5 c.cm. daily, given subcutaneously by a district nurse, and she has continued taking this dose, except that since November she has omitted her Sunday dose. In November, 1931, the patient menstruated, this being the first period for 8–10 years and lasting five days. Menstruation has since been regular. Since leaving hospital she had put on over 1½ st. and she has no untoward symptoms. The blood pressure is now 85/50 mm. Hg and the pigmentation is much less marked on the skin, and in the mouth. She can now (June, 1932) do shopping and housework without any undue fatigue. The blood-sugar has remained low, at 0·067 to 0·083 per cent., and the blood-urea has varied between 0·03 and 0·046 per cent.

COMMENTS

Spontaneous temporary remissions are known to occur in Addison's disease, but this patient recovered from an Addisonian crisis, has put on 1½ st. in weight, and is able to shop and do housework. It is impossible to decide on the ultimate prognosis in these cases at present because sufficient time has not yet elapsed for the prolonged effect of the cortical hormone to be noted. Levy Simpson [1] reports another patient who is in good health nine months after treatment with cortical hormone although in a semi-comatose condition when treatment was begun. It is important that the treatment should be continued after the patient has recovered from the more acute symptoms, and the adequate maintenance dose of cortical extract must be decided upon, just as the maintenance dose of insulin is ascertained after recovery from diabetic coma. The patient described above received 50 c.cm. of the extract intravenously on the first day, 20 c.cm. daily for the next three days, 10 c.cm. daily for a further period of three weeks after which 5 c.cm. were given daily. In emergency, the extract is best given intravenously, combined with glucose and saline, but later subcutaneous injections are quite satisfactory. Treatment must be continued indefinitely in most cases, and if it is suspended, relapse is likely to occur. Benham [2] reported a patient who recovered from an almost moribund condition when treated with cortical extract but relapsed and died after treatment with cortical extract had been suspended.

With the introduction of an active cortical extract it is probable that the prognosis will be found to be better in cases of Addison's disease due to atrophy of the suprarenal glands than in cases due to tuberculosis.

FIG. 1

Patient 18 days after commencement of treatment with eucortone, showing extreme pigmentation, wasting, and asthenia. A woman of the same age is photographed for comparison.

Rowntree and Snell[3] describe the post-mortem findings in 31 cases of Addison's disease, 26 being tuberculous and 5 atrophic in origin. Of the 26 tuberculous cases, only 4 had no evidence of active tuberculosis in other organs, whereas all the atrophic cases showed no evidence of active tuberculosis anywhere in the body.

It is therefore of great importance to try to arrive at a diagnosis of the exact nature of the pathological process in the suprarenal glands causing the Addisonian symptoms. Rolleston and Boyd[4] in 1914 reported shadows in the suprarenal region on radiographic examination of a patient suffering from Addison's disease and Thompson[5] emphasised the importance of radiography of the suprarenals in showing direct evidence of disease of these organs, and the probability of tuberculosis being the cause. Rowntree and Snell[3] reported shadows in 11 of 34 cases in which the suprarenals were found to be caseous at post-mortem examination.

In the case recorded, the complete absence of personal and family history of tuberculosis, with negative clinical and radiographic findings, suggest that she may be suffering from suprarenal atrophy, although tuberculosis cannot be excluded with certainty.

Toxic effects following injection of the extract were noted by Benham et al.[2] in their cases, the symptoms being rigors, hæmaturia, and albuminuria. The extract used in the case recorded was Eucortone, prepared by Allen and Hanburys Ltd. The method of extraction is based on the process originally described by Swingle and Pfiffner.[6]

The first extraction of the gland is made with diluted alcohol, the extract after removal of the alcohol being extracted with benzene. The benzene extract, after removal of the solvent, is treated with acetone and the acetone-soluble portion distributed in a mixture of dilute alcohol and petroleum ether. The dilute alcoholic solution contains the active principle together with a small proportion of adrenaline. This is filtered through a layer of permutit until the adrenaline is completely removed. The alcohol is then removed at a low temperature in vacuo. The extract is diluted so that 1 c.cm. is equivalent to 30 g. of fresh gland, and after standing in the refrigerator, any deposit is filtered off through a bacterial filter and the filtrate bottled under sterile conditions.

To avoid reactions it is important that the extract should be given slowly and, when possible, in small initial doses of 2 c.cm. and that the preparation used should be free from adrenaline.

In the case recorded above the patient had a rigor after the first injection of 50 c.cm. of extract, but here the large initial dose was necessary because of her grave condition.

SUMMARY

1. A case of Addison's disease is reported, with recovery from a crisis, so severe that death appeared to be imminent. 2. The importance of attempting to discover the pathology of the suprarenal lesion is emphasised. 3. Response to cortical hormone in crisis is dramatic, but treatment must be continued indefinitely in most cases. 4. Glucose and saline intravenously is of great help in crises, to combat dehydration and low blood pressure. 5. The severe asthenia and the pigmentation are controlled by the continuous administration of eucortone. On the other hand the blood pressure remains depressed and the blood-sugar low; in spite of this the patient is now able to lead a normal life.

FIG. 2

Patient seven months after continuous treatment with eucortone. The fading of the pigmentation and increase in energy are well seen. The same woman is photographed with the patient for comparison.

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ANÆSTHESIA AND ANALGESIA IN NORMAL LABOUR CASES

ONE YEAR'S EXPERIENCE AT A MATERNITY HOSPITAL

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Dolor Dolentibus Inutile.—*Galen.*

THE medical staff of the Leeds Maternity Hospital at the end of 1930 decided at my suggestion to try to ensure that during the following year every patient entering the hospital for confinement should receive general anæsthesia during the second stage of labour. The practice was first introduced into the hospital by me in September, 1926, but during the ensuing four years only a small minority of the patients received the benefit of it.

The hospital is the midwifery training school for students of the Leeds School of Medicine; they live in a hostel adjoining the hospital for the three months of their appointment, which is quite distinct from the gynæcological dressership, and they are immediately available for any duties which they may be required to carry out. It was not considered feasible to get the two house surgeons to administer all anæsthetics, as their time is already adequately occupied with other duties in connexion with the 108 beds in the hospital, and with the extern department, which attends about 600 confinements annually. It was therefore decided to put the students on to the anæsthetic duty, and a roster was made by which each student in turn took on for 24 hours the work of administering chloroform *à la reine* with mask and drop-bottle to the normal cases. This practice was thought desirable primarily for humanitarian reasons, which have been brought before the public frequently in recent years—i.e., in order to relieve pain in the patients to whom the anæsthetic was given. It was also considered that if the practice were made general the medical students and pupil midwives attending the work of the hospital would come to regard the relieving of the pains of labour as a normal and desirable action, so that when they in their turn should start practice their patients also might receive the benefit of mitigation of their pain from skilled hands. It was hoped that if careful records were kept they might form the basis of conclusions as to whether from the medical, as distinct from the humanitarian, point of view, anæsthesia was sound practice or otherwise. The opportunity was also taken during the year of trying out various analgesics commended in other centres. At the end of the year, seeing that no clinical investigation of this size has been published since the public interest was aroused in the question of anæsthesia and analgesia during labour, it was felt desirable that a report of the results, relating to the 1327 normal confinements included in the year's work, should be prepared, with comments and conclusions.

CHLOROFORM

It should be noted that Leeds medical students are not usually taught the use of chloroform at the Leeds General Infirmary, where the rest of their clinical training is undertaken, and so they receive instruction in this at the Leeds Maternity Hospital, with opportunity to practise it, so that they can go forth competent to wield this important weapon of the obstetric armamentarium.

The Table shows the results of chloroform anæsthesia in normal cases.

Table showing Anæsthesia in Normal Cases (1327 Cases)

Receiving Anæsthesia: 829 (62 per cent.)

—	Total.	Perineal tears.	Post-partum hæmorrhage.	
			All cases treated for excessive loss.	Cases treated with saline.
Primiparæ .	502	203 (40%)	68 (14%)	18 (3·6%)
Multiparæ .	327	70 (21%)	53 (16%)	10 (3·1%)
Not Receiving Anæsthesia: 498 (38 per cent.)				
Primiparæ .	103	35 (34%)	19 (18%)	5 (4·9%)
Multiparæ .	395	77 (20%)	59 (15%)	16 (4·1%)

The percentage of patients receiving anæsthesia (62 per cent.) was lower than had been hoped. This was partly because it took some time to get the new routine working, and partly because a considerable number of patients was admitted shortly before delivery, too late to receive an anæsthetic. In the main the students did the work conscientiously and well. The reason why the proportion of primiparæ receiving anæsthesia (83 per cent.) is so much higher than the proportion of multiparæ (45 per cent.) is that the primiparæ tend to come in a much longer time before birth.

In 712 cases where the duration of the administration of anæsthesia was recorded exactly, the average duration was 13 minutes. The shortest case had three minutes, the longest one hour and 35 minutes.

Perineal laceration.—It is alleged in favour of anæsthesia that the patient under chloroform runs less risk of sustaining a tear of the perineum, owing to the muscular relaxation obtained. I have very little doubt from my own experience that this is true, but it does not emerge from the figures of last year. Of anæsthetised primiparæ 40 per cent. had tears, as against 34 per cent. of non-anæsthetised primiparæ. Of anæsthetised multiparæ 21 per cent. had tears, as against 20 per cent. of non-anæsthetised multiparæ. All tears of the vagina and perineum are included, however trivial. The difference between the two classes is not very great, but as far as it goes shows the contrary to what one would expect. I suggest that the reason for this is that these anæsthetics are given by comparatively inexperienced anæsthetists, who do not always realise the necessity for deepening the anæsthesia as the head comes over the perineum. Generally speaking, if the patient is only lightly under as she receives the strong stimulus of the passage of the head over the perineum, she is less controllable than if she is completely conscious, and so laceration is more likely to occur. Ideally, the patient should be just in the third stage of anæsthesia as the head is born.

Post-partum hæmorrhage.—I have found it difficult to obtain a satisfactory definition of this condition from the available data. Ultimately I have decided to include under one heading in the table *all* patients who received treatment—e.g., ergot, pituitary extract, salines—for loss of blood after delivery. Undoubtedly a large number of patients whose condition never warranted anxiety received treatment; sisters and staff nurses on duty in the labour ward may give ergot and pituitary without reference to the house surgeon, and frequently do so when it is not really

necessary. Among the primiparæ, 14 per cent. of the anæsthetised received treatment, 18 per cent. of the non-anæsthetised; among the multiparæ 16 per cent. of the anæsthetised, 15 per cent. of the non-anæsthetised. Here again the difference between the two classes is not great, but the figures at any rate afford no support to the view that chloroform *à la reine* predisposes to hæmorrhage after delivery. If only the more serious cases are considered, where treatment by rectal or intravenous saline was employed, the figures are definitely better in the anæsthetised patients, both primiparæ and multiparæ. Of primiparæ not receiving anæsthesia 4·9 per cent. had serious post-partum hæmorrhage, as against 3·6 per cent. among the anæsthetised. Of multiparæ not receiving anæsthesia 4·1 per cent. had serious post-partum hæmorrhage, as against 3·1 per cent. among the anæsthetised. Where either ether or chloroform is given for prolonged and continuous anæsthesia, as in the cases of assisted delivery (forceps, breech extraction, &c.), the hæmorrhage rate is considerably increased: in primiparæ to 29 per cent. (all cases treated) and 13 per cent. (cases treated with saline), and in multiparæ to 37 per cent. (all cases treated) and 20 per cent. (cases treated with saline).

I have not made any attempt at comparing the lengths of the various stages of labour with and without anæsthesia. The point at which the first stage passes into the second is much too indeterminate for the compilation of accurate figures. It is usual to reckon the second stage as beginning at the moment when, on pelvic examination, the cervix is found to be fully dilated; but obviously full dilatation may have been present for an indefinite time before the examination was made.

There is no doubt that the anæsthesia has proved very acceptable to the patients. I have heard their appreciation of it from their own lips in a great many cases. Only two patients refused it during the year.

There has been no fatality or accident as a result of anæsthesia during the year.

It is sometimes claimed that chloroform *à la reine* increases the necessity for forceps application. During the year 1931, in which the clinical material dealt with was approximately similar to that of 1930, the general forceps rate was 9·7 per cent., in spite of a high rate among the hyoscine cases (see below), as compared with 10·5 per cent. in 1930. There was no case in which chloroform *à la reine* was started and the forceps had to be used subsequently.

As regards fœtal results, all stillbirths and neonatal deaths occurring during the year are explained by ordinary obstetric causes except three.

No. 750.—Admitted as an emergency for prolonged labour. Spontaneous delivery after 95 minutes chloroform *à la reine*. Child died of convulsions. It is probable that the cause of death was meningeal hæmorrhage, but no post-mortem examination was made.

The other two cases are mentioned under hyoscine.

HYOSCINE AMNESIA

I have already described this method elsewhere, and I wish now to lay special stress on points not mentioned in the previous article.[1]

The technique is to start by giving three doses of gr. 1/100 of hyoscine hydrobromide hypodermically at half-hourly intervals, and thereafter gr. 1/100 every two hours as long as labour lasts. During 1931 the number of patients treated by this method was 132. The results were as follows:—

Excellent (complete amnesia after the second or third injection)	40
Good (complete amnesia for pains as above, but remembered the putting on of the mask) ..	16
Fair (considerable relief, but with memory islands)	9
Unsatisfactory (little or no relief)	40
Unrecorded (no records of progress or result kept)	27

A large number of the unsatisfactory cases was due to faulty selection of patients, or to failure to carry out the technique. This method is definitely contra-indicated in cases of primary inertia, because of the colossal dosage necessary if labour lasts, say, 24 hours from the start of treatment. In my previous paper I advised starting treatment in primiparæ at three fingers' dilatation. Gauss, at the Würzburg clinic, which I had the privilege of visiting last year, decides on the time for starting twilight sleep not from the size of the os, but from the strength and frequency of the pains. I have become convinced that this is much the better practice, and now start, as he does, when the pains are coming at least every five minutes and lasting 20 seconds. If this rule is followed one does not start twilight sleep in cases of inertia. The treatment is also contra-indicated in cases of disproportion until the disproportion has been overcome—i.e., the head has descended into the pelvis. It is difficult to get nurses to give a dose of the drug if birth appears imminent; attention is concentrated on the perineum and the drug is forgotten. This is particularly unfortunate, as the patient is liable to remember the worst of her pains and to reconstruct the whole of her labour from them.

If the 27 unrecorded cases are omitted, together with 25 cases in which primary inertia was present, or one or more of the later doses was forgotten, the revised list is as follows: Excellent, 40; good, 16; fair, 4; unsatisfactory, 20. A comparison of this list with the unrevised one shows that in a high proportion of cases with results less than good it is not the method that is at fault, but the way in which it is carried out.

In the conduct of these cases the main trouble is the restlessness of the patient. In six cases in this series there is a note that the patient became very unmanageable; moderate restlessness is common, while in about 10 per cent. of cases (13 out of 132) the patient lies so quiet, even during pains, that a general anæsthetic is unnecessary; all these 13 cases had perfect amnesia. Virtually all the remainder received chloroform *à la reine* for normal delivery (84) or a continuous ether or chloroform anæsthetic for assisted delivery (32). The forceps rate is high: 12 out of 80 in the revised list—i.e., 15 per cent. The number of injections given varied between 3 and 12. The patient who received 12 injections became very difficult to manage, but she had a spontaneous delivery and perfect amnesia.

Fœtal results.—In the whole series of 132, six babies were stillborn and two died. The causes of stillbirth were: hydrocephalus, 2; anencephalus, 1; perforation, 1; and forceps, 2 (one with contracted pelvis and an occipito-posterior position). In the second forceps case the child's heart beat for 50 minutes after birth, but no respiration occurred. It is probable that the cause of death was meningeal hæmorrhage, but no dissection was done, so that it is not possible to deny categorically that the hyoscine (gr. 5/100 given) played a part in the baby's death.

Of the two infants which died one had imperforate anus, and the other was born with white asphyxia and died soon afterwards. The second child may

[1] Claye, A. M.: Brit. Med. Jour., 1931, ii., 12.

have had a meningeal hæmorrhage. No dissection was done, and besides the hyoscine (gr. 5/100 given) it is relevant to mention that the patient had received quinine grs. 30 to induce labour.

Of the remaining babies, one was drowsy at birth, but recovered without special treatment; all the others were born alive, breathed and cried at once, and made good subsequent progress.

Hæmorrhage in hyoscine cases may be shown as follows:—

132 cases: 32 assisted, 100 normal.

32 Assisted Deliveries

Total of cases treated for post-partum bleeding, whether serious or slight ..	10 (31%)
Serious cases treated with saline, &c. ..	3 (9%)

The figure of 31 per cent. corresponds fairly closely to the figures for *all* assisted primiparæ (29 per cent.) and multiparæ (37 per cent.) mentioned above; the figure for the serious cases (9 per cent.) is definitely lower than the corresponding figures for all assisted primiparæ (13 per cent.) and multiparæ (20 per cent.).

100 Normal Deliveries

Total of cases treated	7 (7%)
Serious cases	2 (2%)

In view of the very low figure among the normal deliveries treated with hyoscine, it is probable that the relatively high figures among the assisted cases are due to the prolonged general anæsthesia, and have nothing to do with the hyoscine.

The statement is sometimes made that hyoscine predisposes to post-partum hæmorrhage. In this connexion it should be noted that the figures for normal cases given above (total cases 7 per cent., serious cases 2 per cent.) are lower, very considerably, than any of the figures for *all* normal cases, with or without chloroform *à la reine*, in the Table. This bears out the statement of Jennings,[2] who in his series found that "the loss of post-partum blood was small."

BARBITURATES

Pernocton, a 10 per cent. solution of the sodium salt of the secondary butyl-β-bromallyl barbituric acid, which produces almost instantaneous sleep when injected intravenously, with amnesia lasting from about half an hour to four hours, was employed in seven cases. It has not been used enough to make any generalisation regarding its value. It is in use at the Würzburg clinic in conjunction with hyoscine (small doses controlled by memory tests), and is believed by Gauss [3] to be the best method at present available for producing twilight sleep. I saw six completely successful consecutive cases under treatment from start to finish at Würzburg last summer, and have used it successfully in my own practice several times, but it has not yet been found feasible to try it out in the hospital.

Since the publication of O'Sullivan and Craner's [4] article on the use of nembutal (sodium ethyl-methyl-butyl barbiturate) and chloral in labour this combination has been used in the hospital, and a short report of our early experience with it was given in a letter to THE LANCET (1932, i., 1175). I should like to conclude by stating my belief that in this last combination of drugs we have what is at present the best means of relieving the pains of labour which can readily be employed by the general practitioner.

The results of the first year of clinical experiment in anæsthesia may be considered satisfactory; it is being continued during the current year, and we hope to obtain even better results.

I am indebted to my colleagues on the honorary staff of the Leeds Maternity Hospital for permission to record their cases; to the house surgeons during the year who helped in supervising the administration of anæsthetics and analgesics, and in recording the results, especially to Mr. D. W. Currie; and to all those students of the Leeds School of Medicine who gave valuable time and effort to collaborate in the work.

[2] Jennings, D. R.: Ibid., 1929, ii., 801.
[3] Gauss, C. J.: Schmerz, 1928, ii., 130.
[4] O'Sullivan, J. V., and Craner, W. W.: THE LANCET, 1932, i., 119.

Clinical and Laboratory Notes

ASTHMA FROM SENSITISATION TO CHROMIUM

BY H. JOULES, M.D., M.R.C.P. LOND.
PHYSICIAN TO SELLY OAK HOSPITAL, BIRMINGHAM

THE increasing use of chromium in chromium plating has resulted in increased attention being paid to the well-known effects of this substance—chrome dermatitis and septal ulceration (Trumper [1]). These lesions are well known to all factory workers, and preventive measures, initiated by the Factory Department of the Home Office, associated with early treatment, are succeeding in limiting the trauma and reducing the number of cases. The lesions which ensue upon the absorption of the metal or its compounds are less well known, and general sensitisation has received little attention. It is, however, a fact that the occurrence of asthma in chrome workers was noted by two French observers, Drs. Delpech and Hillairet, as long ago as 1869,[2] who record five cases in which asthma was a prominent feature. They noted, too, the presence of vomiting, on which Trumper has laid some stress.[1] Sir T. Legge [3] (1899) also recorded attacks precipitated by this metal in one man who had a family history of asthma. Since this, however, asthma due to chromium has not received attention; Trumper, in the article quoted above, mentions sensitisation in respect to skin lesions only. It is for this reason that the following case seems of importance, coupled with the fact that asthma resulting from such an inorganic substance must be extremely rare.

A man, aged 41, was admitted under my care on April 21st, 1932, suffering from a typical and severe attack of asthma, associated with a subsiding dermatitis.

The relevant history was as follows. No member of his large family had ever presented any evidence of asthma or any associated allergic phenomena. The patient, who had hitherto been a plater, using various metals, with the exception of chromium, all his life, had no history of any previous ill-health whatever. In November, 1931, a chrome-plating plant was installed, and he shovelled 3 cwt. of chromic acid from the barrel prior to starting up the process, wearing short rubber gloves for protection. Two days later he noticed a rash on the exposed parts of the forearms, accompanied by irritation of the scalp and back of neck, while the eyes and nose "watered" somewhat.

He was able to continue work despite the persistence of a slight chrome rash until February, 1932, when some "tightness of the chest" began to manifest itself towards the end of his day's work after being in the chrome-plating room. This "tightness of the chest" increased until dyspnœa caused a cessation of work for 24 hours, by which time it had cleared. Resumption of work in the same room incapacitated him with another attack of asthma after two days. At this time, too, the dermatitis became much more severe. During the ensuing eight weeks the patient was intermittently returning to work and receiving treatment for the consequent asthma. This continued to the date of admission to hospital, immediately prior to which he had worked for two days only.

On examination on admission he had some lichenised dermatitis of the backs of hands and forearms, slight conjunctivitis, and shallow ulceration of right side of the nasal septum. Severe dyspnœa, accompanied by some

cyanosis and an intense feeling of restriction of chest movements were present. The lungs on examination presented the typical picture of severe spasmodic asthma — examination of all other organs revealed no abnormality—urine was normal, and no trace of chromium could be detected therein. The bronchial spasm subsided gradually with the use of antispasmodics. Radiographic examination now showed a chest comparatively normal except for some emphysema.

Twenty-one days after admission, when the patient was in good health, the skin of the forearm was lightly scarified through a solution of potassium bichromate (gr. 1 in 25 m.), a control on the same arm, and further controls on a normal patient being used. Within ten minutes a red areola one inch in diameter was manifested at the site of testing the patient, this was followed by wheal with areola about 1½ inches in length, as shown in the accompanying photograph. The reaction persisted for 48 hours, while all controls were negative.

Photograph of lesion on forearm by scarifying through pot. bichromate solution (A). B = control.

On its subsidence gr. 1/25 of potassium bichromate in the above solution was injected intradermally into the right forearm. A similar definite local reaction ensued. At this time the patient had no knowledge of the nature of the investigations being undertaken. The following train of events was then noted: after one hour, irritation of hands, with subsequent reddening, and also some running of the eyes and nose. After two hours, "tightening of chest," which soon developed into severe and typical asthma. This attack, despite injection of adrenaline and other measures, continued unabated for 18 hours.

The patient has now been under my observation for eight weeks and this is the only semblance of asthma that he has had. Owing to the impossibility of his obtaining employment not exposing him to chrome, an attempt is to be made to bring about desensitisation by subcutaneous injections of small doses of potassium bichromate. The history before admission, the local dermic reaction, and the subsequent asthmatic attack would seem to leave little room for doubt that here we are dealing with a specific allergic asthma due to chrome sensitisation. It is interesting to consider whether this was brought about mainly by the considerable initial dosage of chromic acid dust on the day of his first exposure, or whether had he only worked at the chrome plating vat—where the exposure to chrome is relatively slight owing to protective clothing and local exhaust ventilation—he would have become sensitised in this way. Apparently, though he is highly sensitive to potassium bichromate, he has not become sensitive to many other allergens, since on testing with group proteins the results were uniformly negative.

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1. Trumper, H. B.: Brit. Med. Jour., 1931, i., 705.
2. Delpech, A., and Hillairet, M.: Annal. d'Hyg. pub., 1876, xlv.
3. Legge, T. M.: Factories and Workshops. Annual Report for 1899, London, 1900.

SUDDEN DEATH DUE TO A TUMOUR OF THE PITUITARY GLAND

By L. A. Dingley, M.D. Lond., F.R.C.S. Eng.

SENIOR HON. SURGEON TO THE WEST BROMWICH AND DISTRICT GENERAL HOSPITAL

Sudden death from tumours of the pituitary gland is rare, and I know of only two recorded cases.[1] [2] In each of these the patient died a few hours after the onset of symptoms, which were those of deepening coma, characteristic of cerebral hæmorrhage.

In the following case the patient, a clerk, was 37 years of age. He was well built, a little on the stout side, the weight being evenly distributed. He was normal to clinical examination, having been carefully examined for life insurance within two months of his death. There was no suggestion of acromegaly or of pituitary disorder. His wife had had two children, though one had died at birth owing to a difficult confinement. He had put on weight in the early days of the war whilst undergoing training, and had served throughout, most of the time in France, without any sickness.

During the past six years he has had very little illness. In 1926 he had a mild attack of pleurodynia, and in October of 1927 he had an attack of herpes of the face, followed by defective vision, diagnosed by an ophthalmic surgeon as due to a retrobulbar neuritis. This condition was considered to be due to the herpes, and completely cleared up by March, 1928. Since that date he has remained well. One day some months ago I casually met him and advised him to reduce his weight, which he did gradually by cutting down the fats and carbohydrates of his diet.

He left home apparently in good health about 8.15 A.M., in good time to walk to the office, as was his usual practice, a distance of about two miles. He seems to have changed his mind and to have decided to catch the 'bus. This entailed hurrying for a short distance, though there was no great exertion. He mounted the 'bus and as he was climbing the stairs he fell down dead.

Post-mortem examination.—Externally he was a well-built man of normal development, distribution of hair, &c., and except for an abrasion on one shin, there was no sign of external injury. He had an arcus senilis in each eye. The heart, lungs, and abdominal contents were all normal except for a few fine pleural adhesions and for a slight early atheroma of the aorta. The heart muscle and the valves were all healthy.

The membranes of the brain were normal, there was no subarachnoid hæmorrhage, and it was only on the removal of the brain to examine the circle of Willis that the enlarged pituitary gland was noticed. The gland was 18 × 15 × 12 mm. in size, and the fossa was roughened and eroded, especially the posterior wall and the posterior clinoid processes. The section of the gland, kindly examined and reported upon by Prof. Haswell Wilson, showed an adenomatous hyperplasia of the chromophobe cells, with large areas of hyaline degeneration and collections of old hæmorrhage and blood pigment. There was also a considerable recent hæmorrhage.

As regards *family history*, two aunts have died of heart disease, and a sister, a year previously, and at about the same age, died suddenly. She was on a motor tour and remained in the car whilst the other members of the party went into a shop. They came out, she collapsed and died instantly. Unfortunately no post-mortem was made, and

[1] Long, E. R.: Arch. Neurol. and Psychiat., 1927, xviii., 576.
[2] Monro, J. D. R.: The Lancet, 1913, ii., 1539.

death from heart failure was returned, though she was a very energetic person and with the exception of a very mild attack of influenza a few years before, had always been very well.

The two previously reported cases simulated death from cerebral hæmorrhage; this case is of interest in that it simulated death from cardiac failure. It is also of importance from the insurance point of view because the patient had been recently carefully examined and no lesion discovered.

A CASE OF ADDISON'S DISEASE

BY WALTER BROADBENT, M.D. CAMB., F.R.C.P.LOND.
SENIOR PHYSICIAN TO THE ROYAL SUSSEX COUNTY HOSPITAL, BRIGHTON

A LADY, aged about 55, had been diagnosed as a case of Addison's disease six months before she came to Brighton. She had gone downhill rapidly, and had been in bed for three months.

When I first saw her she was very thin and very weak, and much talking or any movement made her short of breath. Pigmentation was marked. Blood pressure was 90 mm. systolic, 60 mm. diastolic. The apex-beat was in the nipple line but could not be felt, and the heart sounds were unusually weak. Nothing abnormal could be felt in the abdomen. In the chest there were some œdematous crepitations at both bases.

She was given tuberculin B.E. injections once a week, beginning with 0·00001 mg. This was very slowly increased, as there was a rise of temperature of 1·2° to 1·5° after each injection for the first four months, but for the past four weeks there has been practically no reaction. She was also given Tabloid Adrenaline 0·003 g. last thing at night and first thing in the morning, a long time apart from any food. To get the full effects of adrenaline it should be given on an absolutely empty stomach. This, also, is the case with other gland products, such as parathyroid and pituitary. After two and a half months she was able to sit up in her room, and a fortnight later could go out in a bath-chair. Now, after five months, she is up all day, and can walk a mile. She has put on flesh, and the pigmentation has nearly all disappeared. Her blood pressure is 110/90.

Seven years ago I treated a hospital patient who had Addison's anæmia on similar lines with tuberculin and adrenaline. She made a perfect recovery, and has been earning her living as a domestic servant.

Corrigendum.—In the article by Dr. Temple Grey, published last week, line 19 on p. 128 should read "300 c.cm. for ages 10 to 12" instead of as printed.

NEW MIDDLESEX MENTAL HOSPITAL. — Sir William Lobjoit, chairman of the mental hospitals committee of the Middlesex county council, recently laid the foundation-stone of a new mental hospital at Porter's Park, Shenley, Herts. The estate, including the residence, was furnished for £80,000; the cost of the building, which will accommodate 2000 patients, is estimated at £520,000.

GLASGOW DENTAL HOSPITAL.—Last year 65,529 patients were attended, over 57,000 completed operations were performed, and 548 persons were supplied with artificial teeth made at the hospital. It was stated at the annual meeting last week that 70 per cent. of the applicants for admission to Glasgow hospitals are suffering from diseases arising from faulty teeth, and that two-thirds of the 300 waiting for dental treatment would not have needed it had they taken care of their teeth in earlier years. This is the only institution of the kind in western Scotland.

NEW INVENTIONS

AN ELECTRIC RETINOSCOPE

ELECTRIC retinoscopes have not compared favourably with the usual method employed for retinoscopy—viz., a mirror and an external source of light. This is partly due to the difficulty of reproducing in a space of about 10 cm. the optical conditions which normally require a space of a metre or two, in which the beam of light is slightly divergent.

Another great disadvantage of the instruments has been the glare scattered by the edge of the hole in the mirror, or from the surface of the glass of the mirror when one looks through a hole made by removing the silvering. A glare of this kind is objectionable in an ophthalmoscope, but in a retinoscope, where one looks at a fainter reflex from a considerable distance, it is a great handicap.

FIG. 1.—The electric retinoscope.

The present instrument shown in Fig. 1 has overcome this last disadvantage by the use of the glare shield, a sectional diagram of which is given in Fig. 2. A short, fine tube is fastened into a plate of thin metal at an angle of 45 degrees. The plate is behind the mirror, the tube projecting through a hole drilled at 45 degrees. The projecting end is cut at an angle such that the top of the tube is flush with the front surface of the mirror, while the lower part is left of sufficient length to prevent any light from the beam reaching the top of the tube. The other end of the tube is cut at right angles to its length, and the tube is made as short as possible. The effect produced is that of shielding the eye from any glare when using the instrument.

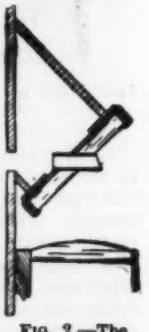

FIG. 2.—The glare shield.

Mr. Thomson Henderson suggested a device of this kind some twenty years ago and Mr. Bishop Harman has recently had it fitted to the ophthalmoscope he has designed.[1]

Modern lamp-makers must be given credit for one great improvement, a very small lamp filament, almost square in appearance. This enables a very regular and symmetrical patch of light to be projected, and avoids a pseudo-astigmatic effect inseparable from the long coil or line filament hitherto employed. The power of the focusing lens in the instrument has been kept low, and the aperture is small so that lens aberrations are greatly reduced.

The use of red or amber light for retinoscopy has been advocated for some time and possesses the advantage of being less irritating to patients who are sensitive to bright light, so that retinoscopy in these patients can be carried out more satisfactorily.

The red filter of this instrument is in a hinged cell at the top of the illuminating tube, and can be moved easily in or out of the beam. The reflex obtained when using the red filter is bright and clear, and it is quite useful for estimating errors of refraction in a patient whose pupils are small. The intensity of the light can be varied at will by means of the rheostat fitted in the handle of the instrument.

The lens system is attached to a sliding collar around the illuminating tube. When the collar is at

[1] THE LANCET, 1932, i., 622.

the bottom of the tube, the beam is divergent, as with a plano mirror. As the collar is moved upwards, the beam becomes less divergent, a similar effect to that of the very shallow concave mirror. Still further, the filament will come to a focus in the plane of the patient, a position to be avoided in use. At the top position of the collar the filament focuses between the instrument and the patient, and diverges from that point to give a divergent beam in the plane of the patient, as with a concave mirror retinoscope. The change from plano to concave mirror effect can be made by one finger while using the instrument. A standard Ever-Ready battery No. 1829 supplies the lamp bulb and is contained in a sand-coated non-slip handle. A fitting with leads to an outside source of current can be supplied for use in the consulting-room to take the place of the battery. The battery can be used in place of the fitting when desired.

The instrument is made by Messrs. Rayner and Keeler, Ltd., 100, New Bond-street, W.1.

J. W. TUDOR THOMAS, D.Sc., M.D., M.S., F.R.C.S.

MEDICAL SOCIETIES

ASSOCIATION OF AMERICAN PHYSICIANS

THE forty-seventh annual meeting of this association was held at Atlantic City on May 3rd and 4th under the presidency of Dr. T. B. FUTCHER (Baltimore).

Diet in Renal Disease

Dr. E. H. KEUTMANN and Dr. W. S. MCCANN reported observations on four cases which led them to conclude that patients in the latent or chronic active stages of hæmorrhagic Bright's disease may take 75 to 200 g. of protein per diem without ill-effects. The subjects of the test were four men ranging in age from 15–25 years. All were observed in the clinic during acute onset or exacerbation of hæmorrhagic Bright's disease, and at the time of the experiments one was in the chronic latent stage of the disease, and three were in the chronic active stage. Observations extending over a year were made, during which the diet contained about 75 g. of protein. An increase of the protein allowance to 200 g. per diem for one week resulted in no measurable harm, and the experiments were continued. In two cases an increase in proteinuria was noted when 150 g. per diem was given, but in spite of this the renal function as measured by the urea clearance (Van Slyke) was not diminished. When a liberal allowance of protein was given in the diet, hæmaturia was not increased, renal function (as measured by blood-urea clearance) improved, blood pressure remained within normal limits, and the patients improved clinically.

Dr. D. D. VAN SLYKE (New York) said that these observations accorded with his own experience in both hæmorrhagic and degenerative nephritis. Although cautious at first in giving much protein to patients with decreased renal function and nitrogen retention, he had found it desirable, even in such cases, to disregard the level of the blood non-protein nitrogen, and to give enough protein to maintain, if possible, the tissues in a good state of nutrition and to keep the plasma proteins at such a level that œdema is avoided. He had seen many nephritic patients who seemed to have been unnecessarily weakened and made œdematous, for months or years, without retarding the progress of their disease, by being put on routine low protein diets; while others, who had escaped such dieting, had maintained an astonishing degree of vigour almost up to the onset of terminal uræmia. Digestive function and general reaction to the diet—rather than theoretical deductions from the blood non-protein nitrogen—should be followed in estimating the maximum amount of protein required in a given case.

Dr. H. O. MOSENTHAL (New York) had found that patients with Bright's disease would consume 50 to 75 g. of protein a day, but usually were unable to take more with any comfort. With special nursing, while the patient was in bed, larger amounts could often be consumed. The almost universal error in treatment, until a few years ago, was that the object was to shield the kidneys from damage. It was now appreciated that the pathological changes in the kidneys and the hypertension were not materially influenced by high protein diets; while the anæmia, œdema, and malnutrition would be benefited by forcing the proteins. The only contra-indication to the use of forced feeding appeared to be marked renal insufficiency or the threat of retention uræmia.

Dr. J. S. MCLESTER (Birmingham, Ala.) said that in both acute hæmorrhagic nephritis and chronic degenerative Bright's disease diets containing liberal amounts of protein should be given; in the former disease 100 g. daily, in the latter even more. Experience had shown that such an allowance tends to make good the plasma albumin deficit and thus facilitates recovery. Even in nephrosclerosis there was no reason for rigid protein restriction, and in order to maintain the patient's strength and vigour as long as possible the diet should provide approximately 75 to 100 g. of protein daily.

Dr. MCCANN, in closing, said he did not consider the very high protein diets as optimal. The average patient could rarely take more than 100 g. per diem with comfort, and this level was probably the best. Under special circumstances Hindhede, of Denmark, had been able to maintain adequate nutrition on quite low levels of protein intake.

Poliomyelitis

Dr. J. R. PAUL and Dr. J. D. TRASK said that their epidemiological studies in New Haven last summer indicated that so-called abortive poliomyelitis might be commoner than has been suspected. During the epidemic they saw many cases of mild illness with fever, headache, vomiting, or perhaps sore-throat, but without meningeal or myelitic involvement. In 222 families, from each of which one or more cases of frank poliomyelitis had come, it was found that about 40 per cent. of these patients' siblings (under 15 years) developed such minor illnesses more or less contemporaneously with the appearance of a frank case within the family. Control families showed a 10 per cent. incidence of these illnesses among children of the same age during the epidemic period. The age-distribution of the minor illnesses was similar to that of frank poliomyelitis. In three communities, during the local epidemic, the incidence of these minor illnesses proved to be about six times that of the frank cases of poliomyelitis. Twelve attempts were made to isolate the virus of poliomyelitis by the monkey inoculation test from the throats of patients with characteristic minor illnesses on

various days of the disease. Two of these were successful.

Dr. W. H. PARK (New York) reported on the use of convalescent serum in the early stages. A coöperative effort, he said, had been made in New York by the Department of Health, the Department of Hospitals, and a committee of the Academy of Medicine to make potent convalescent serum available for therapeutic use, and, if possible, to evaluate the results. The cases were first reported to the health department laboratories, and then they were visited by an experienced diagnostician. If the case seemed suspicious, spinal fluid was removed and sent by a messenger to the research laboratory. If the diagnosis was confirmed, the patient was either sent to one of the hospitals or was quarantined at home. If the family physician desired to have convalescent serum administered, one of the pædiatricians from the Academy of Medicine was summoned. In the comparison of treated and untreated cases (see Table) the average age of the treated group was about 6·5 years, of the untreated group about 5·5. The average time of the administration of the serum was 1·6 days after the first meningeal symptoms. There was no definite indication that earlier treatment, as compared with later treatment, reduced the consequences. Antipoliomyelitis horse serum produced excessive meningitis when given intraspinally. "While there is a uniformity of opinion," said Dr. Park, "among those engaged in the treatment of the preparalytic cases in the epidemic of 1931 that no curative effect was observed and no statistical evidence was obtained that it was of value, yet as the serum did no appreciable harm I believe many will still wish to use it, seeing that we know of no other treatment that holds out even a possibility of specifically being helpful."

Preparalytic cases.	Cases	No paralysis or weakness at end of three weeks.	Weakness at end of three weeks.	Paralysis.	Died.
Serum not used.					
Observed by Health Department	345	261 (75·3%)	50	31	3
„ Academy of Medicine	102	72 (70·5%)	12	16	2
Early combined totals	447	333 (74·5%)	*62 (14%)	47 (10·5%)	5 (1·1%)
Later „ „		*364 (81·4%)		78 (17·4%)	
Treated with serum.					
Convalescent Health Department	95	72 (75·4%)	10	10	3
Serum used. Academy of Medicine ..	477	329 (69·0%)	36	94	18
Early combined totals	572	401 (70·0%)	*46 (8%)	104 (18·1%)	21 (3·6%)
Later „ „		*424 (74·1%)		*127 (22·2%)	
Potent antipoliomyelitis horse serum ..	56	37 (66%)	5 (9%)	7 (12·5%)	7 (12·5%)

* When revisited after an interval of four to five months approximately, one-half had lost their weakness and the others had more or less paralysis. These cases are therefore distributed between the no paralysis and the paralysis groups.

Suprarenal Extracts

Dr. G. A. HARROP, Jr., and Dr. ALBERT WEINSTEIN (Baltimore) said that they had found that suprarenal extracts had some potency, both clinically and in adrenalectomised animals. Recently they had preferred to use whole-gland extract as having greater potency than cortex alone. In Addison's disease they were now giving 0·1 to 0·3 c.cm. daily of the present extract. In relapse more was required, and the cases were more difficult to treat. Clinically not much change was seen in weight or in blood pressure, but some results were very promising. In experimental work on dogs they removed the suprarenal, but not always its medulla. The effect of removal in dogs was to cause anorexia, loss of weight, weakness, and bradycardia, but these symptoms did not develop until the second gland was removed. The outstanding effect of removal was a change in all the organs and endocrine glands, indicative of atrophy. Dogs could not be raised to maturity by giving suprarenal cortical hormone, but in adult dogs its injection restored normal metabolism. They believed that the effect of the hormone was to maintain the chemical integrity of the cell in regard to its oxidation processes.

Dr. L. G. ROWNTREE and Dr. C. H. GREENE (Rochester, Minn.) reported that they treated 32 patients with Swingle's extract between June, 1930, and June, 1931. At first they had difficulties with reaction from toxic products, but during recent months the material had been non-toxic. The results had shown: (1) relief of anorexia, nausea, and vomiting, with gain of appetite; (2) relief of fatigue and increase of strength; (3) disappearance of pain and improvement in sleep; (4) decrease in pigmentation; (5) gain in weight; (6) return of normal gastro-intestinal activity; and (7) change in blood pressure. They had also found that resistance to infection was improved. These patients were extremely susceptible to infection. One man had an acute septic pneumonia; he was given large doses and made an uninterrupted recovery. In a control group of patients with various types of asthenia the results were negative.

Dr. J. C. AUB (Boston) said that about ten years ago, when working on the metabolic action of the suprarenal gland, he had found that the metabolic rate, which fell after extirpation, returned to normal on constant injection of a physiological amount of adrenaline. The rapid development of muscular fatigue was also corrected by such constant adrenaline injections. While there were obvious differences in the extracts of the suprarenal cortex and medulla and the duration of their effects, these similar physiological responses were of interest, particularly in view of the anatomical proximity.

Diabetes and its Treatment

Dr. L. H. NEWBURGH and Dr. DOROTHY S. WALLER (Michigan) had investigated the statement that considerable amounts of carbohydrate may be added to the diet of the diabetic, without causing glycosuria or increasing the need of insulin, when the dietary fat is also sharply reduced. They had found that the inherent maximal capacity of a diabetic to dispose of the total available glucose without glycosuria was unrelated to the type of diet; it was not reduced by fat nor augmented by carbohydrate. The capacity

of insulin to cause the metabolism of glucose varied according to: (1) the total amount of glucose to be acted upon, and (2) the ratio between glucose and insulin. For example, in a patient whose tolerance was 174 g. of glucose, the addition of 14 g. of glucose required 10 units of insulin. Hence, each unit disposed of 1·4 g. of glucose. As the carbohydrate of the diet was further increased, insulin became progressively more efficient until one unit disposed of 7 g. of glucose when the latter exceeded the tolerance by 100 g. Increases in carbohydrate beyond this point were unattended by further increase in the efficiency of insulin.

Dr. SOLOMON STROUSE and Dr. SAMUEL SOSKIN (Chicago) pointed out that diabetic patients wandering from clinic to clinic did equally well under widely varying diets, perhaps because of some common denominator such as a comparatively low caloric intake. At their clinic they had maintained a group of patients on three successive isocaloric diets: (1) relatively high in carbohydrate, (2) relatively high in fat, and (3) relatively high in protein. During each period sufficient insulin was given to control the diabetic manifestations to about the same degree, but no attempt was made to render the urine entirely sugar-free. The diets varied widely in composition —though not as widely as possible—and the order in which they were given also varied. Diabetic manifestations were adequately controlled on all the diets, and there was nothing to indicate that each of them could not have been continued indefinitely. Almost all the patients preferred the high carbohydrate diet. The insulin requirements on the high fat diets were not quite half of that of the other periods; but, considering the extreme range of the diets, it was clear that a small difference in insulin allowed remarkable flexibility in management. From the standpoint of the patient it made very little difference whether 17 or 33 units were injected during the day.

Dr. W. R. CAMPBELL (Toronto) said that Dr. Newburgh's results confirmed the view that the carbohydrate equivalent varies with the diet used, and extended the principle into ranges of higher carbohydrate concentration than had previously been clinically verified. Diets high in carbohydrate were most successful if they approximated to the basal caloric requirements, but this was not adequate therapy for the diabetic patient. The diabetic should be brought back to a sufficient caloric intake to restore his economic status. These experiments had usually been of too short duration, and some of the high carbohydrate diets had later proved too high.

Dr. E. P. JOSLIN (Boston) agreed with Dr. Strouse's conclusions. There was no need to go to extremes in diet. He would like to know how much carbohydrate Dr. Newburgh's average patient now took. Years ago his cases did well with low carbohydrate and low calories, but insulin allowed a new arrangement. Most people now gave much more carbohydrate than formerly. A year ago at the Deaconess Hospital the average was 143 g., and this year it was 140 g. They had seen no reason to increase this amount.

Dr. MOSENTHAL said that the observation that a small dose of insulin is much more effective than a large dose, because it takes care of more grammes of carbohydrate per unit, was very important from the practical point of view. This had, he believed, been the general experience, and was illustrated in the following case. A boy of 12 could not be rendered sugar-free with three doses of insulin, of 40 units each, given throughout the day, but when four doses of insulin of 10 units each were administered he became sugar-free while he was on the same diet. The tendency to the universal use of one form of dietetic therapy in diabetes was not altogether advantageous, if the best results were to be obtained. During the past few years high carbohydrate diets had come to the fore and had been strongly advocated by many. But sometimes the high starch diet, though successful at first, was followed by a loss of tolerance, and it became necessary to return to the older diets containing more fat and more protein if the urine was to be maintained sugar-free and if excessive doses of insulin were to be avoided. Subsequently the high starch diet might be resumed. In many cases there seemed to be a cycle in tolerance for starches.

Dr. NEWBURGH, replying to Dr. Joslin, said that in his clinic their aim was to adequately nourish as many patients as possible without insulin. They began with a small available glucose intake—35 to 50 g. and 1000 to 1400 calories, derived chiefly from fat. They then went up stepwise till they reached the patient's tolerance. If this provided a maintenance diet they did not use insulin, but he might have more carbohydrate if he cared to be burdened with insulin. If the tolerance provided for a supermaintenance level of energy on their plan, naturally fat was removed. If tolerance was reached at a too low level of energy, insulin was, of course, given. At this point they now abruptly added a relatively large amount of carbohydrate in order to obtain the maximal efficiency of insulin from the start. Glycosuria was rigidly avoided.

Dr. STROUSE said that his experiments revealed no reason for imposing markedly abnormal or disproportionate dietary mixtures upon the diabetic patient. They further showed that the diabetic manifestations of many patients could be equally well controlled on widely varying mixtures, and the effort to approach a normal diet for such patients therefore seemed logical. He believed that the problem of feeding insulin-treated diabetic patients did not involve the application of formulæ or strict adherance to any particular type of diet.

AFFAIRS OF GUY'S HOSPITAL.—The report of Guy's Hospital for 1931 records hard work and pecuniary difficulty. Since 1925 there has been an annual average of deficit of about £12,000 on income and expenditure account, but last year it reached £14,491. To preserve the endowments it has been necessary to borrow, and the interest on loans now amounts to the formidable sum of £8500 a year. It is pointed out that in the last half century the expenditure of a fully equipped general hospital has increased fivefold, and that Guy's is no longer an "endowed hospital" in the ordinary sense of the term. The expenditure cannot be brought much below £190,000 a year, and voluntary gifts have fallen noticeably. There was a small decrease in both in- and out-patients, the former being explained by a slightly longer (18 days) stay. About one-half of the patients now contribute to the cost of their maintenance, directly or indirectly through such organisations as the Hospital Saving Association. The only out-patients' department which shows an increase is the dental clinic. New in-patients numbered 11,528, and they cost £4 14*s.* 11*d.* each weekly, a fall of 9*d.* Since the date of the report the governors have decided that, except in cases of dangerous illness, visitors to wards containing infants will be restricted to parents or not more than two relatives of any child. This decision was taken in view of the danger to infants in the Bermondsey and Rotherhithe war memorial ward arising from infection introduced by visitors.

Recently the Shepherd trustees presented the hospital with £500 to provide a more suitable resting-place for the remains of Thomas Guy, the founder. He is buried in the crypt of the hospital chapel, the stone coffin resting on rough brick piles on the stone floor. The crypt has recently had to be underpinned, and it is proposed to make such alterations in it as may be needed to provide a little memorial chapel.

REVIEWS AND NOTICES OF BOOKS

(I.) Cytology and Cellular Pathology of the Nervous System

Edited by WILDER PENFIELD, Professor of Neurology and Neurosurgery, McGill University, Montreal. New York: Paul B. Hoeber. 1932. Three vols. With 886 illustrations. Pp. 1267. $30.

(II.) Histopathology of the Central Nervous System

An Introduction by Means of Typical Microphotographs and a Short Text. By Prof. Dr. L. BOUMAN (Utrecht) and Prof. Dr. S. T. BOK (Leiden). Utrecht: Oosthoek's Publishing Company. 1932. With 53 plates. Pp. 37.

(I.) THE last decade has seen a rapid growth in the scope and importance of neurological pathology, and Prof. Penfield has edited a work which justly claims to be an international contribution to its literature. It is a compilation of 30 articles by 26 contributors of standing in the domains of cytology or neurological histology, of whom 17 are working in North America, nine being European. This country is represented by J. G. Greenfield, who provides an article on the inflammatory cells in the central nervous system.

The cytology and cellular pathology of the nervous system is interpreted widely to include the vessels, the meninges, the sheaths and end-organs of the peripheral nerves, the pineal and pituitary bodies and the retina, as well as the central nervous system proper. The treatment of these specialised subjects is so elaborate that probably no single reader would be qualified to criticise the whole subject matter. The first work, issued under the editorship of Wilder Penfield, is uniform with the "Special Cytology" published three years ago by Hoeber, and it is fair expectation that it will enjoy a comparable popularity. In Volume I. the normal cytology of the neurone is described by Cowdry in an amplified version of the corresponding section in his "Special Cytology" (1929) with which this book is uniform, while M. Bielschowsky deals with the pathology of this cell in a valuable survey. C. U. Ariens Kappers contributes a section dealing at some length with the internal physiology of the neurone. Outstanding sections in this volume are the accounts of the sympathetic ganglia by F. de Castro, and of the nerves of the blood-vessels, heart, meninges, digestive tract, and urinary bladder by P. Stöhr. Both sections are abundantly illustrated. In the second volume the section on the neuroglia by the editor is again an elaboration of the corresponding section by Penfield and Cone in the "Special Cytology," and gives an up-to-date summary of the subject. Prof. Penfield is well-equipped for this task, since he has studied in Madrid with Cajal and Hortega, and has made considerable contributions to our knowledge of the neuroglia. In his editorial capacity he has been fortunate in securing an authoritative account of the microglia and the pineal body from the pen of Del Rio-Hortega, most of whose previous work has been published in Spanish journals not easily accessible. E. Agduhr's section on the choroid plexus and ependyma contains much original matter; his interesting observations on the comparative anatomy of the ependyma require experience for their evaluation. In the section on the pituitary P. C. Bucy devotes considerable space to the cytology of the pars nervosa. This subject has always been dismissed rather summarily by other writers, mainly because attempts to demonstrate the component cells of the pars nervosa by the ordinary neuroglial methods have so often failed. These cells now described and figured are revealed as a bizarre variety of neuroglia, akin to the astrocyte. An original contribution that will be particularly appreciated by ophthalmologists is the section on the pathology of the optic nerve and papilla by W. Cone and J. A. MacMillan.

In the third volume, which contains studies of certain pathological groups collectively entitled "neoplasms, malformations, and hæmatogeneous reactions," J. W. Kernohan has elaborated his recent work on the primary tumours of the spinal cord, material of which he has had a unique experience. Still another section from Prof. Penfield, on the mechanism of internal hydrocephalus and the histology of the cerebral tissue that has undergone distortion and atrophy, embodies many new ideas. That part of the third volume which is devoted to the gliomas has been written by P. Bailey from a purely cytological standpoint. Those who may have hoped for some modification or simplification of his classification will be disappointed; indeed, he defends it with vigour. In a chapter on malformations J. H. Globus gives an informative account of tuberose sclerosis, amaurotic family idiocy, and Schilder's disease.

It speaks well for the editing of the work that extraordinarily little overlapping or discrepancy is noticeable. The only obvious example of overlapping is a discussion of the work of Essick and Woollard on the reaction of the arachnoid mesothelial cells to particulate irritants and vital stains by Lewis H. Weed and W. Boyd. Translations are for the most part fair, and if the English creaks a little in places, it is usually quite intelligible. Exceptionally a sentence is obscure, notably on p. 191, "all parts of a tissue are solidary and the nerve is no exception to this rule," where the context offers no help in making the meaning clear. The learned book fulfils the need for a work of reference on this growing subject, while an amplification of Volume III. to include such conditions as the demyelinating diseases of the central nervous system, syringomyelia, and specific infections is plainly desirable. It is recognised in the preface that much has had to be left out, and a hope is expressed that it will be possible to elaborate this last volume at some future date. To this hope we subscribe.

(II.) The appearance of the book by Bouman and Bok on the histopathology of the central nervous system is opportune, because it goes far towards supplementing the longer work. It deals with a group of what may for convenience be called the medical diseases of the nervous system from a purely cytological standpoint. A special attempt has been made to give a pictorial representation and to describe the reactions of the different kinds of glia in these pathological conditions. The book consists principally of an atlas of admirable microphotographs reproduced on glossy plates. The photographs of metallic preparations are particularly good and clear, those of spirochætes (Plate XXVIII.) being about the best representations of these organisms that we have yet seen. It is a pity that in every case the magnifications are not given. The atlas is preceded by a short explanatory text which is good and clear as far as it goes.

This book is suitable for the advanced student, and will be appreciated by pathologists interested in neurological work.

Text-book of Medicine

Second edition. By Various Authors. Edited by J. J. CONYBEARE, M.C., M.D. Oxon., F.R.C.P., Assistant Physician to Guy's Hospital. Edinburgh: E. and S. Livingstone. 1932. Pp. 1004. 21*s*.

Conybeare's book, first published in 1928, has taken an assured place among the smaller text-books of medicine. Students have found the required instruction shortly and concisely put, and practitioners have found information sufficient for most of their needs without reference to fuller works. In this edition some revision has been necessary and certain useful additions have been made. Dr. H. Stott, Dr. A. A. Osman, Dr. R. C. Brock, and Dr. F. A. Knott have joined the list of contributors, which now includes five members of Guy's Hospital staff. Dr. Stott is responsible for the admirable section on Tropical Diseases; Dr. Osman for the section on Renal Diseases, which contains fairly full theoretical considerations of the acid-base equilibrium of the blood and an adequate if somewhat conventional account of acute and chronic nephritis; the latter is divided simply according to the old classification of azotæmic and hydræmic, thus following the scheme proposed by Castaigne as long ago as 1906. Dr. Brock has rewritten the short article on empyema, and Dr. Knott has collaborated with the editor in the chapter on blood diseases. In this chapter more exact indication of iron dosage in simple achlorhydric anæmia would be welcome.

In most respects this edition shows no great changes from the first, and the authors have wisely resisted the danger of introducing recent but as yet imperfectly confirmed advances in diagnosis or treatment. No attempt is made to describe laboratory technique of biochemical tests, nor is any serious account of physical signs included. For these the reader will gladly refer to other works or to his practical experience and teaching, since a full discussion of clinical symptoms, ætiology, prognosis, and treatment of all important diseases is to be found here. A useful appendix on examination for life insurance is included. The printing is excellent, the index sufficiently full, and the price remarkably moderate.

An Introduction to "Avertin" Rectal Anæsthesia

By J. KEMPSON MADDOX, M.D., M.R.C.P. With a foreword by HAROLD DREW, F.R.C.S. Australia: Angus and Robertson, Ltd. 1932. Pp. 126. 9*s*.

THIS little book tells in simple language and with ample corroboration and reference all that is known concerning the clinical use of avertin for anæsthesia. The pharmacological and physiological aspects of the subject are also adequately described. Any anæsthetist or practitioner who has not yet used avertin and wishes to do so could find no more trustworthy or helpful guide than this manual.

We gather that avertin first reached Australia early in 1929 and Dr. Maddox, who had witnessed its application in London, was the pioneer of its use in his own land. His demonstration of the great value of this drug for children, or others, who have to undergo repeated painful dressings, is impressive. No harm has followed many repetitions of avertin narcosis in the same patient, and the drug has been used with success to control tetanus. Dr. Maddox discusses fully all the contra-indications to the use of avertin and shows how few they are in actual practice. We are not prepared to go all the way with him when he claims for it a "perfect abdominal relaxation." It is rare for this relaxation to be sufficient for laparotomy, at any rate in the upper abdomen, unless supported by local or inhalational anæsthesia. Dr. Maddox does not, however, recommend a full narcosis from avertin; he is in full accord with those who demand from this drug merely a basal narcosis. This basal narcosis is, he holds, in some respects better than that which can be provided by any other means, since it reduces the amount of anæsthetic required and dispels most post-operative risks and inconveniences. He recommends making the injection 20 minutes before the time of operation. We ourselves prefer a longer interval, believing that the full effect is not reached generally much before half or even three-quarters of an hour after injection. This depends, no doubt, partly on how rapidly the injection is effected. Dr. Maddox advises taking five minutes over it, but more nearly ten minutes are usually taken. With these trifling exceptions we are in accord with all his precepts. The book is excellently produced and indexed.

Sex Hostility in Marriage

By TH. H. VAN DE VELDE. London: William Heinemann, Ltd. Pp. 296 and plates. 17*s*. 6*d*.

THIS volume is one of the trilogy on married happiness, the other volumes of which have already been reviewed in our columns. Dr. Van de Velde has written it in order "to help those numerous people whose happiness is menaced by the spectre of hostility in marriage, and to combat this danger." He addresses it also to doctors and to mental and spiritual advisers of the family. In the first section he analyses the factors that conduce to hostility between the sexes; in the second he proposes remedies. Two kinds of hostility are distinguished—a primary form, which is represented as being spontaneous and "natural," as are antagonisms between certain human races and animal species; and a secondary form, which is the product of the prohibitions, vicissitudes, frustrations, and ties which arise from the interplay between powerful desires and the social conventions which seek to restrict and stabilise their expression. The case made out for the existence of a primary sex hostility is far from convincing. The five following chapters dwell on the contrast between masculine and feminine traits. The discussion, which is not lucid, focuses itself upon what is described as a "psychological tragedy of woman," which is expounded in two consecutive pages of capital letters. It is held to consist in the simultaneous desire experienced by most women for submission to and domination over a man.

The section, in which Dr. Van de Velde suggests measures for preventing and removing sex hostility, contains an account of Kretschmer's psycho-physical types, supplemented by a singularly inappropriate collection of illustrations. Some dogmatic prognoses, based on no statistical evidence, are advanced for the outcome of marriages between partners of pyknic and leptosome conformations. It is also claimed that valuable guidance may be obtained on the compatibility of two persons from expert study of their physiognomies and handwritings. In the event of threatened marital dissensions, readers are advised to seek medical aid from a "marriage therapeutist"—an individual who should possess a special knowledge of endocrinology, gynæcology, psycho-analysis, and the modern theories as to constitution, together with the balanced wisdom of the old-fashioned general

practitioner. Married persons should deliberately avoid "points of irritability" in their partners, and should cultivate (or acquire) a sense of humour. They should also practise on each other a process described by the author as "wordless suggestion," which consists of one partner secretly willing the good of the other.

The book will probably appeal to the lay rather than to the medical public. The translation leaves much to be desired, and there is no index.

Traité d'anatomie humaine

By P. POIRIER and A. CHARPY. New fourth edition. Entirely recast under the direction of A. NICOLAS, Honorary Professor of Anatomy in the Faculty of Medicine, Paris. Tome I. Part I. Introduction: L. MANOUVRIER. Anatomie générale et Développement des os: J. VERNE. Constitution générale du Squelette et Squelette céphalique: M. AUGIER. Paris: Masson et Cie. Pp. 663. Fr.130.

Poirier and Charpy's treatise has long been a classic. In this issue, under the old name, we have the first part of a work which promises to be of outstanding merit. Prof. Nicolas and his 31 colleagues deserve warm praise for this splendid initial result of their labours. We have had occasion frequently to speak of the pleasure afforded us by French anatomical books, with their somewhat different angle of vision, and the present volume exemplifies this well. A few sentences, from the introduction by Prof. L. Manouvrier, may be quoted as they seem to give a key to the ideas animating the compilers. He says:

"Le défaut de vues générales peut être un obstacle même à l'investigation des menus faits, à l'analyse aussi bien qu'à la synthèse. Il peut entraver de toutes façons les progrès d'une science. C'est en grande partie ce défaut qui a fait considérer l'Anatomie humaine comme étant à peu près achevée, alors qu'elle en est encore à sa période de début; c'est lui aussi qui a fait regarder les variations infinies du corps humain comme des détails sans importance ou des 'jeux de la Nature,' alors que leur connaissance est au contraire du plus haut intérêt au point de vue de la science pure aussi bien qu'au point de vue des applications pratiques; c'est enfin ce défaut qui a fait classer l'anatomie humaine parmi les 'sciences accessoires,' dans le programme des études médicales, alors qu'elle doit y figurer au contraire comme la science fondamentale, sans la connaissance approfondie de laquelle il ne peut plus y avoir aujourd'hui de médecin digne du titre de docteur."

The descriptive part of the work begins with a section on General Anatomy, not too long, but well and carefully written. This is followed by osteology, a subject which occupies the remainder of the book. Chapters on development of bone and the general constitution of the skeleton lead to the consideration of the skeleton of the head, which is given precedence over the other bony members. We would have welcomed more emphasis on the origins of the mesenchymal rudiments which precede the actual formation of the cartilaginous skeleton, for the mesodermal bed in which a cartilage forms may throw a light on a morphological question which is not provided by the cartilaginous structure itself. For example, much of the uncertainty about the value of the stapes would vanish if it were clearly recognised that the (precartilaginous) stapes is unquestionably the dorsal end of the (precartilaginous) bar of Reichert, whatever relations may exist between them when chondrified. The criticisms of Betchow concerning the handle of the malleus, also, might be considered unnecessary if the origin of the mesenchymal ingrowth in which it is formed were taken into account.

The second part of the book deals with the skull, its developments and variations. Variations are described under the headings of their apparent causes or conditions of formation, and this plan, while open to objections, has great practical value. Under the occipital bone, for example, the variations are classed as those of segmental origin, of chondral and osseous origin, and from cerebral, vascular, muscular, and articular causes. Under the segmental heading are gathered all those somewhat confused but fascinating subjects, vertebral plurality of the occipital, increased number of hypoglossal canals, manifestation of the last occipital vertebra, occipitilisation of the atlas, fusion between the bones, and the well-worn question of the pro-atlas. If, in this wealth of material, we feel that we would like to find more weight thrown on arcualia and interarcualia, this is probably only sentiment; in any case the persistent separation between adjacent half-sclerotomes at the occipito-atloid level is of the same value, and we come back once more to the basic question of mesodermic origin.

The last division of the book deals with the skull as a whole, its fœtal and adult state and evolution, and its multiple variations and anomalies. It is to be observed that, while the views of classical writers on the question of synostosis of the sutures are fairly given, the findings of Todd and Lyon are accepted unreservedly, based as they are on a rich and completely recorded material. The section on craniometry includes a full list of the measurements, angles, and indices employed in this field of research, with some consideration of the variations thus brought to light. A short account of grave pathological abnormalities of the skull brings the descriptive part of the book to an end. A complete reference list of memoirs and the index complete the volume.

This is the beginning of a great text-book, and we look forward with pleasurable anticipation to seeing the volumes now in the press.

Applied Pharmacology

Fourth edition. By A. J. CLARK, M.D., F.R.C.P., F.R.S., Professor of Materia Medica and Pharmacology in the University of Edinburgh. London: J. and A. Churchill. 1932. Pp. 590. 17*s*.

IN this new edition of Prof. Clark's well-known book the general plan has been retained of discussing in successive chapters the physiology of different systems and then giving an account of the action of drugs on each. There are two new features. The first is a historical introduction surveying the development of the modern science of pharmacology, and the second, a statement of the approximate wholesale prices of many drugs. This should be of value to practitioners who are unaware of the relatively high cost of many of the newer preparations. It is only two years since the last edition was published, yet considerable revision has been required, especially of the parts dealing with the actively growing points of the subject—viz., endocrines and vitamins. The chapter on the action of drugs on the autonomic nervous system has been altered to bring it into accord with Loewi's theory, which the author regards as firmly established. One of the chief merits of the study of pharmacology, apart from its practical value, is that it forms an interesting and important connecting link between the study of physiology and clinical work. The student will find this book an invaluable aid in bridging this gap.

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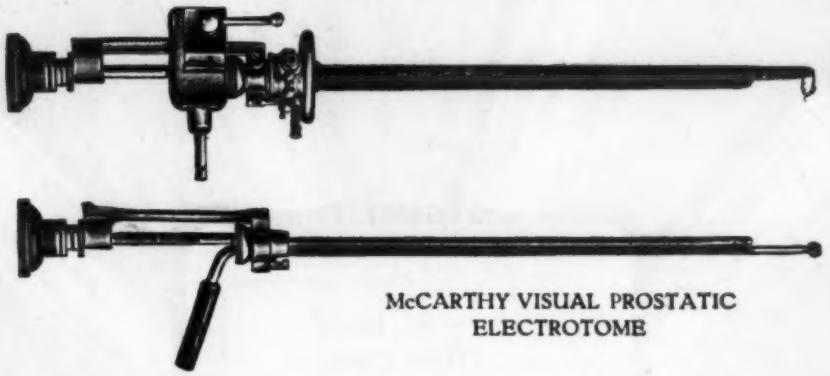

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[*See also pp.* 24 & 25.]

THE LANCET.

LONDON: SATURDAY, JULY 23, 1932

MIDWIVES AND THE USE OF DRUGS

In view of recent discussions on the possibilities of alleviating pain in childbirth among that large majority of the women in this country whose labour is conducted in their own home by midwives, it is useful to review the nature of the restrictions which at present limit the midwife's use of drugs. These restrictions are based partly on law and partly on custom. The law comes from two sources. In the first place there are the Dangerous Drugs Acts and their consequential regulations and orders. Opium is a dangerous drug within the Acts and therefore cannot be possessed or administered by any unauthorised person. A midwife is ordinarily not an authorised person, but in 1921 the Home Secretary granted a general "authority" to be in possession of and to administer preparations of opium in the case of every certified midwife who has notified the local supervising authority of her intention to practise. Chloroform, on the other hand, is technically not a dangerous drug; midwives are under no statutory disability in obtaining supplies of it. A chemist, in his desire to warn purchasers of the nature of the drugs he sells and in order to protect the public, may exercise a restrictive influence; but, if the use of chloroform (for example in the form of capsules containing 20 minims each) became accepted and common, steps would have to be taken to ensure that a certified midwife would be able to obtain such capsules. The second source of the law is to be found in the Midwives Acts and the Statutory Rules framed thereunder by the Central Midwives Board. In these Rules, under the heading of Duties to Patients, the following warning is made prominent by the use of heavy type. Midwives, it is declared, must not, except under a grave emergency, undertake operative procedure or any treatment which is outside their province. A subsequent rule directs the midwife to note in her Register of Cases each occasion on which she is under the necessity of administering or applying in any way any drug other than a simple aperient, the name and dose of the drug, and the time and cause of its administration or application. Consequential and procedural though this direction may seem, it indicates a reasonably wide discretion. In addition the Board issues an Advisory Memorandum as to the drugs which may properly be carried and administered by midwives. This document gives a brief list of "ordinary drugs," classified as aperients, antiseptics, stimulants (including ergot), and sedatives; there is a further list of "special drugs," consisting of opium, tincture of opium (laudanum), Dover's powder, chloral hydrate, and syrup of chloral. Legally the position may be described as conspicuously hortative rather than mandatory. The list, says the memorandum, is not intended to be complete. "No drug," it continues, "should be used by a midwife unless she has been thoroughly trained in its use and is familiar with its administration"—exhortation again rather than command. The Board's Rules and leaflets leave the midwife free to use any drug that is not a "dangerous drug," and, among "dangerous drugs," she may use preparations of opium. The legal position as regards the use of such drugs as, for example, pituitary extract, is not clearly defined.

But now, if this is a true view of the field of law, there still remains the domain of custom or administrative usage. The law may be permissive, bu the local supervising authority may be restrictive Though the Central Midwives Board's Rules allow the use of a range of drugs, and though the best training schools for midwives teach such use, the local supervising authority may issue instructions limiting midwives to the use of a simple aperient except when a registered medical practitioner is in direct charge of the case and gives his own orders. A medical officer of health has considerable powers, formal or informal, and in the background is the warning that the midwife must not go outside her province—a principle which can only mean that she is not to trespass upon the prerogatives and responsibilities of the medical profession. Law or custom, hortatory or mandatory memoranda, national or local rulings, formal or informal directions—it is all one to the midwife. If she disobeys she gets into trouble. She herself, her register, her bag, and her room are liable to inspection. Malpractice or the disobedience of a rule may mean removal from the roll. It is her misfortune if "going outside her province" is differently interpreted by different medical officers of health.

What, then, is to be done? One desirable step is the improved and standardised training of all midwives in the use and knowledge of such drugs as she is allowed to use by the Rules of the Central Midwives Board. This means adequate facilities for using drugs in midwives' training schools, and also that schools which now give less complete training in this respect must conform to the higher standards attained elsewhere. Another possibility is that the Central Midwives Board may in the future give a clearer lead in certain respects, notably in the use of analgesics. The Rules and leaflets issued by the Board, at present perhaps deliberately and necessarily vague, might contain a specific category of permitted analgesics. Here the way will be clearer when full trial has been made of the method of chloroform capsules, recently introduced.[1] The capsules contain only 20 minims of chloroform, so that, even if six are used, the drug content need not be a cause of grave anxiety. It may not be possible to draw a sharp distinction between analgesia and anæsthesia, and to allow a midwife to give a drug which will remove pain without allowing her to use one in doses which might induce total insensibility. But the growing

[1] See THE LANCET, 1932, i., 727 and 1361.

demand on the part of the public for painless labour is becoming more and more vocal and something will have to be done to meet it. The opposition of certain medical men to the use of drugs by midwives is not based on considerations of professional monopoly, but on a real fear of accident due to ignorance. The answer may be that such accidents are among the risks that the public must run; and that while a midwife, as district nurse, is allowed or even encouraged to drive a car—surely a potentially dangerous machine, of the mechanism of which she may know nothing—it is illogical to refuse her the right to use dangerous drugs under controlled conditions.

INTRACRANIAL TUMOURS

SINCE the pioneer work of MCEWEN and HORSLEY steady progress in intracranial surgery has taken place. In 1929, in a statistical study, Dr. LOUISE EISENHARDT gave evidence of this progress by publishing some encouraging figures of the operative mortality in a series of intracranial tumours [1] at the Johns Hopkins and Peter Brigham Hospitals. Between 1922 and 1929 she reported a progressive tendency to improvement, notwithstanding the fact that each year more difficult and more radical operations were being performed than were previously undertaken. In a recent paper [2] Prof. HARVEY CUSHING gives a further review of these figures, and continues the sequence to the middle of 1931. These data are reproduced in the main in his new monograph on the subject.[3] The later figures reveal a still further reduction in mortality. In the year 1922–23 the operative mortality for all verified tumours, including new and old cases, is reported as 16·9 per cent., and this figure has fallen to 11·0 per cent. in 1926–27 and again to 6·8 per cent. in 1930–31. The fall has not been entirely steady, and it is too early to say whether the very low level reached in 1930–31 is likely to be maintained. That this low rate is not due to a lax definition of post-operative death seems, however, quite certain; rather the standard tends to be too severe. For *every* death in hospital (the average hospital sojourn in the last 100 cases was 39 days), following an operation, no matter how long the interval or what the cause, is recorded as a post-operative fatality. So that, for instance, if a patient gets out of bed at night to go to the lavatory, trips on an obstruction, and dies in a few hours from a fracture of the base of the skull, the death is automatically recorded as a post-operative death. Similarly recorded is the death of a patient who has a fatal infection during an epidemic of influenzal pneumonia. This severe standard may have its drawbacks as well as its advantages. If the deaths subsidiary to operation, as instanced above, form any large proportion of the total, their reduction or increase may mask the movement of the true post-operative deaths. Some information of their number and immediate cause would therefore be an advantage.

Accepting this inclusive definition of post-operative fatalities, a comparison of the figures presenting the four major groups of tumours suggests that most improvement has taken place with tumours situated outside the cerebral substance. Acoustic tumours show a decline in operative mortality from 25 per cent. prior to 1912, to 4·4 per cent. for the period 1928–31. The rate for meningiomas has fallen from 21 per cent. to 7·7; for pituitary adenomas, from 13·5 per cent. to 5·7; for gliomas, from 30·9 to 11·0 per cent. Prof. CUSHING does not accept the view that these improved results are due to earlier diagnoses; as a whole he thinks that the operations each year become increasingly critical and difficult. The principal steps that have made it possible not only to attack these more formidable problems but actually to lower the operative mortality, he enumerates as: (1) the generally accepted methods of decompression to relieve tension; (2) such irreproachable wound healing that secondary infections are practically unknown; (3) the separate closure of the galea by buried fine black silk sutures, which has made the once dreaded fungus cerebri nearly forgotten; (4) in place of ether inhalation, the introduction by DE MARTEL of local anæsthesia, now supplemented when necessary by the rectal administration of tribromethanol; (5) the more precise tumour localisation which in obscure cases Dandy's ventriculography permits us to make; (6) the use of a motor-driven suction apparatus as an indispensable adjunct to every operation; and (7) the successive improvements in methods of hæmostasis, which, since 1927, have been most advantageously supplemented by the introduction of electro-surgical devices. To which must be added the institution of a more careful régime and observation during the immediate post-operative stages.

This work should be a source of encouragement to all interested in brain surgery, and stands as proof of the value of a highly organised technique which admittedly takes up much time and demands skilled team-work. The statistics hitherto presented by no means exhaust the interest of the material. We would welcome a further survey in which the survival period following operation is considered and the degree of benefit to the patient is judged by his ability to resume his place in society.

[1] Arch. of Surg., April, 1929, xviii., 1927.
[2] Arch. Neur. and Psychiatry, June, 1932, p. 1273.
[3] Intracranial Tumours. London: Baillière, Tindall and Cox. 1932. Pp. 150. 26*s.* 6*d.*

ANTISYPHILITIC TREATMENT AND THE EXPECTATION OF LIFE

ANYONE who looks into the history of the use of drugs in the treatment of disease will soon find that most of them, at one time or another, have been employed in doses likely to do serious damage to the patient. Mercury is a notable example, severe stomatitis with gangrene of the gums and necrosis of the jaw, skin eruptions, nephritis, even

affections of the central nervous system, have in the past followed the abuse of mercury in the treatment of syphilis, and there can be no reasonable doubt that many syphilitics would have lived longer if no attempt had been made to aid the *vis medicatrix naturæ*. Though every effort is made to-day to avoid poisoning, the modern treatment of syphilis still involves a prolonged use of powerful drugs, and the question may pertinently be asked whether such treatment is altogether to the advantage of the patient, and whether energetic and long-continued administration of arsenic, mercury, and bismuth impairs in any way the vitality of the essential organs of the body. In a discussion on the attitude of life insurance societies to venereal disease,[1] Dr. OTTO MAY suggested that it was open to doubt whether this prolonged treatment was really of advantage to the patient, but Lieut.-Colonel L. W. HARRISON and Dr. DAVID LEES held the view that life assurance offices should pay more attention than they did to the amount of treatment the syphilitic proposer had received; the inference being that the more thorough and prolonged the treatment, the better the insurance risk.

Though the toxic effects following immediately or a few days or weeks after the intravenous injection of the organic arsenical preparations are well known, there is extraordinarily little information available regarding the effects of long-continued administration. On the other hand, the signs of chronic poisoning with inorganic arsenic are described in every text-book of pharmacology. It is fair to infer from these facts that late toxic symptoms due to arsenic in organic form must be exceedingly rare. Cases have been recorded where, after one or two courses of intravenous injections, intense jaundice has developed. In some cases the symptoms cleared up in a few days to a few months, but others ran rapidly a fatal course, and showed at autopsy acute yellow atrophy of the liver. It has usually been accepted that the hepatitis is caused directly by the arsenical medication, partly because icterus was rarely observed in syphilis before the days of salvarsan, and partly because it has occurred from the use of the drug in non-syphilitic conditions. Dr. LEES informs us, however, that in 1926, within a period of three months, he had seen four cases of acute yellow atrophy of the liver in syphilitic patients, two of whom had had no antisyphilitic treatment of any sort, while two had been treated previously with arsenobenzol, but not intensively. Since that time he had asked the pathologists of the Edinburgh Royal Infirmary to look carefully for lesions of the liver in cases which, prior to the time of their death, had been under energetic antisyphilitic treatment, and which happened to die of intercurrent disease. There had so far been no evidence of damage to the liver cells in such cases. These observations suggest that it is the infection and not the treatment which may be responsible for liver damage.

There is another aspect of the question. Shortly after the introduction of salvarsan, EHRLICH formed the opinion that the neuro-recurrences which followed the employment of the drug were due to incomplete destruction of the parasites, those which escaped acquiring a greater virulence; and, in more recent times, there has been an impression that neurosyphilis is actually increasing in spite of, or perhaps as a result of, modern arsenical treatment. Recently,[2] P. A. O'LEARY and J. R. ROGIN studied 500 cases of neurosyphilis chosen at random from the records of patients examined in the section of dermatology and syphilology of the Mayo Clinic during the years 1928 and 1929. Of these 500 proved and unselected cases, 85 per cent. had *not* received arsphenamine during the early period of infection. The study showed further that modern treatment is of pronounced value in reducing to a minimum the clinical and serological manifestations of the disease. The evidence available, therefore, suggests that while the modern treatment of syphilis subjects the patient to a definite risk, that risk is not great, and is far exceeded by the danger associated with the late results of uncured syphilis.

[1] See THE LANCET, 1932, i., 1199.

THE PUBLIC HEALTH SERVICES

THAT the administration of the public health services under the new economic conditions has involved modification of policy during the past year is clear from the thirteenth annual report of the Ministry of Health, which has now appeared,[3] the report of the principal medical officer being still to come. The Minister's survey of public health work is informative, outlining the direction taken by local authorities in their attempts to adjust expenditure and service on the most economic basis. He recalls that percentage grants in respect of certain public health services were discontinued when the administration of both the public health and the poor-law medical service passed into the hands of a single local authority in each area; and as a result he is absolved from scrutiny of individual items of expenditure, and can turn attention to broad issues. In last year's report it was mentioned that periodical surveys of local health services had been initiated, through which the Minister would be able to satisfy himself that local authorities were maintaining their standard of efficiency. During the past year surveys were carried out on the public health work of 17 county councils, 23 county borough councils, and 10 metropolitan borough councils. After considering reports of surveys made during the year under review or the preceding year, the Minister has been able to send appropriate comment to 11 county councils, 24 county borough councils, and 4 metropolitan borough councils. It is reassuring to learn that the general effect of the surveys so far made has been to show that "local authorities as a whole are maintaining reasonable standards of efficiency and progress." There is naturally some variation in the standards achieved; local service must adapt

[2] The Arsphenamines as Factors in the Production of Neurosyphilis. Proc. of the Staff Meetings of the Mayo Clinic, May 11th, 1932, vol. vii., No. 19, p. 273.

[3] Report of the Ministry of Health, 1931–32. H.M. Stationery Office. 5s.

itself to local need, and the function of public health work would not be fulfilled if the activities of local authorities were limited to a fixed standard of efficiency in every branch of their services.

The surveys made so far have not revealed a deficiency in any one service throughout the country, but the Minister has found reason to criticise faults of administration in some of the areas surveyed. In most cases such faults could easily be remedied, as will be gathered from the instances quoted which follow. Imperfect coördination, between individual public health services and between those services and the transferred poor-law services, is mentioned, and the Minister comments on the failure to separate particular medical services from the poor-law, especially in regard to the appropriation of institutions; some local authorities need to extend antenatal work, to provide facilities for dental treatment of expectant mothers, to appoint consultants who will attend cases of puerperal infection, or to arrange for more home visits to be paid to pre-school children; in other areas better premises, with privacy of access, are required for treatment of venereal disease; elsewhere more use could be made of X ray facilities, or better provision could be made for the diagnosis of tuberculosis; milk, in some areas, is insufficiently supervised. The Minister comments especially on the need for unification of control in the medical services; duplication of effort results where transferred poor-law institutions are administered independently of the other medical services of an authority. The medical resources of an area should be treated as a single unit, and this can best be achieved if the medical officer of health is responsible for the general supervision of the whole of those resources. The Minister considers that the medical officer of health should not merely be called upon to advise the public assistance committee on individual occasions, but that his responsibility should be no more restricted in regard to the transferred services than it is in regard to the public health services.

Special representations have been made to authorities of areas in which the maternal death-rate has been high during recent years, and by March 31st, 1932, replies had been received from 303 local authorities, including those of all the selected areas; of these, 190 had adopted proposals for the improvement of their maternity services, and others had proposals under consideration. Antenatal work is developing steadily and, at the end of 1931, 995 antenatal clinics, provided and maintained by local authorities, were in action, there being an increase over the previous year of 141 clinics; 198 clinics are maintained by voluntary bodies. As far as can be estimated, expectant mothers attending the clinics represented 33·89 per cent. of the total notified births in 1931, as compared with 27·30 per cent. in 1930. Inasmuch as the clinics are not intended for the use of women of all sections of the community, this figure probably indicates attendance of a high proportion of those for whom they are provided. Twenty-five authorities have arranged for uninsured women who engage midwives to be examined antenatally by a local doctor. In a rural county where there were a number of parishes unprovided with midwives the county council have made arrangements for the county nursing association to provide midwifery service. The health visitors employed by local authorities in England have increased to 2680, as compared with 2616 in the previous year. In addition, voluntary associations provide 2267 officers for health visiting, and the total number of visits paid to the homes of children under 5 years of age was 6,887,504, an increase of nearly 300,000 over the figure for the previous year. There was a substantial increase in the numbers of candidates entering for and passing the examination for the health visitors' certificate, and local authorities should no longer find difficulty in obtaining candidates for these posts. Some years ago, 400 births a year per health visitor was suggested as a standard for assessing the number of health visitors required in an area, but this criterion is no longer applicable in view of the duties now undertaken by these officers. The Minister feels that the number required in any area can only be determined by a full consideration of all relevant circumstances, including the time required for adequate visiting of pre-school children in the home. By the end of 1931, 2347 nurses were employed for the home nursing of expectant mothers, patients suffering from puerperal infection, and children under 5 years of age suffering from certain stated diseases. This figure includes 54 nurses employed by local authorities, the remaining 2293 being employed by voluntary associations. The cases attended by these nurses during the year numbered 73,655.

Economy in terms of cash has been achieved by deferring some of the larger schemes of development, but the greater proportion of schemes under consideration in the summer of 1931 have been allowed to proceed. Of schemes estimated to cost about £1,050,000, a series representing an expenditure of about £875,000 have gone forward, but it is made clear that no obstacle will be placed in the way of the development of a service that is urgently needed in the interest of public health—indeed, loans sanctioned for hospital purposes show an increase to £462,049, as compared with £266,740 for the previous year. Concentration of provision for the sick in the larger and better-equipped hospitals is enabling local authorities to economise by closing some of the smaller institutions, and during the year, after satisfying himself that adequate accommodation for the sick was available elsewhere, the Minister has consented to the closing of poor-law institutions in eight districts.

VISITORS to the meeting of the British Medical Association will be welcome at the Offices of THE LANCET in the Adelphi, between the hours of 10 A.M. and 4 P.M., on Friday, July 29th. The house, which was built by the brothers Adam in 1770–80, retains, within and without, reminders of Robert Adam's architectural genius.

ANNOTATIONS

HOW RADIUM ACTS

IT is generally assumed that the value of radium in the treatment of malignant disease is due to the selective action of the emanations on the tumour cell. Tumours are classified or graded according to their radiosensitivity, and it is held that there is something in the constitution of the malignant cell which renders it more susceptible to irradiation than normal cells. It is true that more than 25 years ago, Bashford, Murray, and Cramer drew attention to the vascular changes which occurred in tumours exposed to radium, and ascribed the retrogression of growths thus treated to changes occurring in the stroma rather than to a selective action of the rays on the tumour cell. But these and other observations pointing in the same direction have been forgotten or neglected; attention has become more and more focused on the malignant cell, and this point of view has been further strengthened by the study of the effects of irradiation on tissue cultures. In an article in the current number of the *Journal of Pathology and Bacteriology* on the causes of cell death in irradiated human tissue, Dr. B. D. Pullinger controverts this conception and brings forward evidence to show that the action of radium as used therapeutically is in reality non-specific. Her conclusions are based on the examination of 87 specimens removed during life from various parts of the body, and from 83 post-mortem examinations. This material had all been exposed to radium in the form of seeds, needles, surface applications, or bomb. Briefly, Dr. Pullinger finds that the one constant change in irradiated tissues affects the blood-vessels and connective tissues. It consists essentially in an extreme dilatation and engorgement of capillaries, veins, and arteries. This is followed by thrombosis, and the consequent anæmia of the tissues which follows results in infarction and cell death. Later changes are concerned with the removal and organisation of this dead material, and this process may be a matter of months or even years. These vascular changes may occur at a considerable distance from the tumour which is being irradiated. They may result in extensive anæmic necrosis of bone and muscle, and are responsible for the troublesome necrotic lesions of mucous membranes which are usually described as radium burns. Normal and malignant tissues suffer equally from these vascular derangements, and the apparent specific action of radium on the malignant cell is explained by the fact that many malignant tumours are traversed by an abundance of delicate capillary vessels lying in a loose stroma, the type of vessel which reacts most readily to irradiation. Vascular lesions are especially prone to occur in tissues in which the vessels are thin-walled and lie in a loose supporting stroma. Dr. Pullinger has demonstrated this by applying radium to the anterior abdominal walls of rabbits. Applications which were insufficient to produce lesions in the skin caused pronounced dilatation, engorgement, and thrombosis in the delicate vessels of the loose submucosa of the urinary bladder; and incidentally, this experiment shows that the changes described in irradiated tumours are not dependent on the pathological state of the tissues concerned.

Dr. Pullinger does not deny that radium can exercise a direct action on normal or malignant cells, but she holds that under the conditions in which radium is used therapeutically, its main action is an indirect one on the vascular supply of the tumour, and she would explain the variations observed in the radiosensitivity of tumours, not so much by differences in their resistance to rays, as by the capacity of their cells to survive when their blood-supply is interfered with. If this explanation of the therapeutic action of radium is accepted, and it must be admitted that Dr. Pullinger brings forward a very convincing case, it is clear that the radium treatment of cancer is by no means as simple as has been believed. Any method of treatment of malignant disease must depend upon the capacity of the agent employed to kill the cancer cells without unduly damaging the adjacent normal tissues. Hitherto it has been believed that radium possesses this specific power, but it now appears that its action is not only non-selective, but that it may affect normal tissues detrimentally, and at a considerable distance from the tumour it is desired to destroy. There is general agreement already that the use of radium should be limited to those who are skilled and experienced in its application. This view of its action emphasises still further the danger of its haphazard employment in the treatment of malignant diseases. Elsewhere in this issue Dr. Colwell and Prof. Russ point out a corresponding risk in the medicinal use of radio-active substances in effective dosage.

PROPHYLACTIC VACCINATION AGAINST YELLOW FEVER

THE demonstration by Adrian Stokes and his colleagues some four and a half years ago that rhesus monkeys were susceptible to the virus of yellow fever opened the way to laboratory investigation of this disease. In a number of centres throughout the world yellow fever research is being actively pursued and though it is realised that this work entails a very great risk of infection, it is perhaps not generally known that during this time 32 laboratory infections have occurred and five scientists—Stokes amongst them—have lost their lives. As with other viruses which are dangerous to work on—such as the virus of psittacosis—these accidental infections occur in spite of the strictest precautions, and it would seem a more logical procedure to protect the worker, if possible, by immunisation, rather than resort to elaborate precautionary measures which may not always be effective. Recovery from yellow fever confers a solid and lasting immunity and a considerable amount of work has been done in the attempt to devise a safe and effective prophylactic vaccine. The earlier efforts in this direction, of which the work of E. Hindle in this country is an example, have shown that yellow fever virus inactivated by chemical means (formol or phenol) is capable of producing immunity, but the safety and stability of these vaccines has not been such as to earn their unqualified recommendation for use in man. A number of workers have noticed that monkeys which received yellow fever virus and immune serum developed an active immunity in the absence of any symptoms of infection and recent work by W. A. Sawyer, S. F. Kitchen, and W. Lloyd[1] indicates that this method is a safe and satisfactory one for human use. Their vaccine is made from a "fixed" mouse strain, the virulent mouse brain being either suspended in immune human serum and dried frozen or suspended in normal human

[1] Jour. Exp. Med., 1932, xlv., 945.

serum, the virus suspension and immune serum being preserved separately. Experiments on monkeys having proved satisfactory the method was tried out in man. Fifteen persons received a single injection of the dried mixture, with additional serum separately; one individual received the dried virus and immune serum separately. All sixteen developed active immunity as evidenced by the appearance of specific antibody in their blood; this specific antibody in a few weeks attained a concentration comparable with that observed after an attack of the disease, and it remained high during a period of six months. The symptoms following vaccination were few and did not prevent the person inoculated from continuing his ordinary work. In fact, the vaccine prepared by Sawyer and his colleagues seems to be both safe and efficient, and it should certainly be used to immunise those working with this dangerous virus.

CHRONIC RHEUMATISM IN YOUNG WOMEN

A STUDY of the predisposing social factors in chronic rheumatism amongst young women, made by Miss Joyce Blackham, was discussed at the Second International Conference of Social Work held at Frankfort-on-Main from July 10th to 14th. The work was made possible through a special grant from the Institute of Hospital Almoners. The 50 patients studied were women attending the British Red Cross Clinic, all being over 15 years of age, in whom the onset of disease occurred before the age of 35 years. They were divided into two main groups, articular and non-articular rheumatic cases, particular attention being paid to those suffering from rheumatoid arthritis. They were compared with a control group of 50 healthy women, taken as far as practicable from the same occupations, and the fullest possible history was secured in each case. In such a form of investigation the difficulty always lies, as Miss Blackham recognises, in being sure that the information obtained is as full from the controls as it is from the affected group. A fuller coöperation on the part of the controls was secured by appealing to members of women's organisations, but this does not overcome the probability that "events" are more readily remembered by the affected than by the unaffected, or tend to become exaggerated in the mind of patients. Such considerations tend to throw doubts on the validity of the otherwise suggestive evidence on the effects of shock and anxiety. From a comparison of the number of patients who gave histories of shocks and anxieties, apparently connected with the onset of disease, with the number of controls who had ever experienced similar mental strain, it emerged that 32 of the patients fell in the category "excessive or great" shock or anxiety, as compared with only 13 amongst the controls. Twenty-seven of the patients were assessed as excessive in "nervous" symptoms as compared with seven of the controls, instances of nervous symptoms which seemed to have resulted from the illness being excluded from the assessment. The housing factor—including dampness, so often associated with rheumatism in the mind of the lay (and medical) public—played very little part in this group of cases, but the physical strain of long working hours seemed to be of considerable importance. In the rheumatic group the hours taken were those which the patient was working at the time of the onset of the disease, while in the control group, where there was no concentration on any one point in the girl's life; the hours taken were the longest that the girls had ever worked, with the exception of very temporary overtime. Of the 35 patients who could give definite hours, 26 per cent. had worked over 12 hours per day as compared with only 3 per cent. of the controls. Subdivision of the rheumatic cases suggested that an exceptionally high percentage of rheumatoid arthritic patients had worked excessive hours, but the numbers are too small for much faith to be placed in them. An assessment was made of general occupational conditions, taking into account the hours worked, the nature of the work, the position of the worker, conditions of the workroom, household duties, long journeys to work, and complaints of fatigue from the girl herself. It is possible, as Miss Blackham points out, that strain in the control group was unconsciously assessed more lightly, for a healthy girl does not readily complain of working hours and conditions, and short periods of overwork in the past may have been overlooked; but the disparity between the two groups has convinced her that occupational strain is a factor in the disease. A repetition of this work on a larger scale seems desirable.

VISCERAL SENSE ORGANS

THE fourth Victor Horsley memorial lecture was given in the medical school of University College Hospital, London, on July 20th, by Prof. E. D. Adrian, F.R.S., Foulerton professor of the Royal Society, the chair being taken by Mr. Wilfred Trotter, F.R.S., senior surgeon of the hospital. The lecturer dealt with the action of two groups of visceral sense organs, those in the lungs and those in the great blood-vessels. Their mechanism has been studied by recording the nervous messages which they send to the brain-stem, and they are found to behave like the muscle-spindles and so-called stretch receptors in other parts of the body. Both systems act as governors to keep the respiratory and vascular systems working within safe limits. The nervous messages in the vagus and carotid sinus nerves were demonstrated by gramophone records, in which the nerve impulses were converted into sound to show the effect of changes in the blood pressure and in the degree of expansion of the lungs. These visceral sense organs play an important part in the most essential activities of the body, and as they are stimulated mechanically we may expect to find their action disturbed by disease of the regions in which they lie.

THE DEVELOPMENT OF HEARING

OF all the special senses hearing is the most recently acquired. It is possible to trace the development of the ear from the otolith organs of fishes, whose function is the maintenance of balance; these in turn are developed from the anterior of the lateral line organs which are themselves an elaboration of the end-organs of ordinary tactile sensation and probably act as detectors of currents in the surrounding water. Dr. Beatty has recently provided [1] a pleasantly discursive account of the function of hearing in man, and of its development and position in the lower animals. He concludes that some fishes can hear in a dull and undifferentiated way and, from experiments, that the saccular otolith has an auditory function, for fish possess nothing which corresponds to an organ of Corti, and only a small primitive lagæna. Air-borne noises are transmitted to the water with difficulty, though water is a good conductor of sounds which originate in it. The myth that

[1] Hearing in Man and Animals. By R. T. Beatty, M.A., B.E., D.Sc., Senior Scientific Officer, Department of Scientific Research and Experiment, Admiralty. London: G. Bell and Sons. 1932. Pp. 227. 12s.

monastery carp came for food at the sound of a bell was exploded by more accurate investigation. It was only when vertebrates forsook the water to live in air that the need for hearing became insistent and the hearing organ gradually more elaborate and efficient. A fascinating subject is the evolution of the malleus and incus from two reptilian jaw-bones, and it is a pity that Dr. Beatty has not discussed this more fully. The results of some experiments on the hearing of various animals are noticed and the parallel development of ears and hearing in certain insects. With regard to the mechanism of audition, Dr. Beatty supports the resonance theory of Helmholtz as modified by Dr. Albert Gray, and he reviews the phenomena connected with the sensations of hearing, such as pitch, fatigue, masking, and perception of direction in relation to this theory. Chapters on music and the musical scales, including those of ancient and primitive peoples; noise and its effects; the scientific methods of analysis, of defects in hearing, and the routine tests in use by aurists; the phenomenon known as paracusis Willisii; and the effects of deafness on speech are included. Dr. Beatty writes in an amusing vein, and will not only interest the general reader, but will help workers in the allied fields to correlate their activities.

SUPRARENAL EXTRACT IN ADDISON'S DISEASE

THE remedial action of Swingle and Pfiffner's extract of suprarenal cortex has been closely studied by C. H. Greene and his collaborators at the Mayo Clinic.[1] They distinguish three stages in the course of untreated Addison's disease: the first, in which destruction of the gland has not gone far enough to give rise to signs of cortical insufficiency; the second, in which the characteristic symptom-complex appears; and the third, a terminal period of crisis characterised by severe gastro-intestinal upset, circulatory collapse, low blood pressure, and coldness of the extremities. Their observations have of course been made in these last two stages. The basal metabolic rate, they find, is 5–7 per cent. below normal, and in periods of crisis may fall lower. During treatment with cortical extract it rises, but it is not clear how far the increase is due directly to the hormone and how far to general improvement in nutrition. In the discussion reported on p. 186, J. C. Aub said that adrenaline—which is derived from the suprarenal medulla, not the cortex—was effective in raising the basal metabolism of animals whose suprarenal glands had been removed; and it is interesting to find that G. A. Harrop and A. Weinstein at the same meeting said they now preferred to use a whole-gland extract. It was found at the Mayo Clinic that the subnormal blood-sugar also rose during treatment, while the nitrogen balance became positive as gain in weight was resumed. During the period of crisis, dehydration and renal insufficiency dominate the metabolic picture, and it is urged that these changes may be secondary, and should not be ascribed directly to suprarenal insufficiency. The use of cortical extract in Addisonian crisis is often compared to the use of insulin in diabetic coma, and Dr. Thompson and Dr. Russell do well to point out that glucose and intravenous fluids are required in the former just as in the latter; at this advanced stage it is not enough to supply the missing hormone; one must also tackle the consequences of its deficiency. The case reported by Thompson and Russell on p. 178 shows what remarkable results may now be attained at the crisis, and it is only the last of many records which may be regarded as definitely encouraging though very far from perfect.[2] Harrop and Weinstein,[3] who have treated eight cases with four deaths, point out that experimental insufficiency in dogs is not identical with Addison's disease, and although substitution therapy appears to maintain perfect health in animals it does not do so in human patients. None of their four surviving patients have got back all their strength and vigour; their normal weight has not been regained, pigmentation has not wholly disappeared, and the blood-sugar and blood pressure remain low. Levy Simpson,[4] in the three survivors of his group of six cases, found that cortical extract seemed to have comparatively little effect on the low blood pressure and blood-sugar. He suggested that the hypotension may be due to the absence of adrenaline, and although the actual cause of death in Addison's disease appears to be destruction of the cortex, it is well to remember that injection of adrenaline has sometimes proved of temporary value. On p. 184 Dr. Broadbent describes a case in which adrenaline by mouth was used with apparent advantage in conjunction with tuberculin; and it seems increasingly doubtful, on general grounds, whether a purely cortical extract is the ideal remedy. How far we may expect an ideal remedy remains to be seen. It is too much to ask that every case shall be made curable, and in estimating prognosis it is important, as Thompson and Russell emphasise, to discover if possible whether the primary lesion is atrophic or tuberculous.

[1] Amer. Jour. Med. Sci., 1932, clxxxiii., 1.

THE CENTENARY OF THE BRITISH MEDICAL ASSOCIATION: A HOST OF FUNCTIONS

IN connexion with the centenary meeting of the British Medical Association the convivialities have already commenced, for on Thursday last there were tea-parties, receptions, and excursions arranged for lady visitors, while the annual Representative Meeting, which commenced at 9.30 that morning, offered a chance of inviting overseas representatives to luncheon. On Friday the welcoming of ladies with excursions, tea-parties, and receptions is continuing and throughout Saturday. The annual general meeting of the Association is being held to-day, Saturday, July 23rd, to be followed by an extraordinary general meeting at the B.M.A. House, when the presentation to the Association of Dr. Alfred Cox's subscription portrait will be made, and the presentation to Dr. Cox of an album of signatures and a cheque. On Sunday, July 24th, a pilgrimage will be made to Worcester when a memorial window to Sir Charles Hastings will be unveiled. On Monday, July 25th, there are many private parties and an invitation dinner from the Apothecaries Society in their hall. On Tuesday, July 26th, there are an invitation party at Claridge's Hotel, and the President's reception and dance at the Albert Hall. On Wednesday, July 27th, there are the Irish Graduates luncheon at the Criterion restaurant, and in the evening a reception at the Guildhall by the Lord Mayor and Corporation of London, and another reception at the Wellcome museum. On Thursday, July 28th, an afternoon reception takes place at the London School of Hygiene and Tropical Medicine, and in the evening the centenary dinner will be held in the Albert Hall. On Friday, July 29th, there will be

[2] See THE LANCET, 1932, i., 125, 148, 796.
[3] Jour. Amer. Med. Assoc., 1932, xcviii., 1525.
[4] Quart. Jour. Med., 1932, xxv., 99.

afternoon receptions at the Royal College of Physicians and the Royal Society of Medicine, a dinner to delegates at Dorchester House offered by the *Practitioner*, and a dance at Grosvenor House under the auspices of the Metropolitan Counties Branch. The programme closes on Saturday, July 30th, when a party of overseas delegates and foreign guests will visit Bath and Bristol.

THE OUT-PATIENTS' TARIFF

WE commented recently on the benevolent activities of hospital almoners, whose duties, which certainly involve some degree of after-care of discharged patients, are mostly interpreted to include elaborate arrangements for their welfare and comfort. It is therefore distressing to learn from more than one source that recently in some hospitals the almoner's assessment of an out-patient's liability has been expressed not as a hint at a suitable donation but as a demand for payment for services rendered. The following remarks are typical of those made rather in distress at inability to pay a debt which would not wittingly have been incurred, than in a spirit of complaint :—

"She told me that I must pay five shillings for the consultation and a shilling for the medicine. I can't afford to go again."

"She asked me what I could pay. I was embarrassed, and, hoping she would say it was too much, asked her whether ten shillings would do. She said she supposed so." (This for two visits to the ophthalmic out-patient department which also involved the patient in a payment for spectacles.)

"She said that there was no use appealing to anyone: it was her business to decide what we must pay for advice and treatment, and we could not have it for less."

While no one could object to discrimination against the treatment of those who have no right to attend a voluntary hospital for out-patient treatment, those who are accepted should surely not be told to pay certain fees for treatment. It is probably the pressure behind the almoner to maintain in full working force a hospital whose financial responsibilities are growing beyond its income, or the suspicion that the patient is not of the class which she has come to associate with out-patients, that leads her to take up this business-like attitude. Almoners for the most part do not need to be warned against judging from clothes or general address, or even a bare statement of income and responsibilities, that the patient can really afford a substantial contribution to the funds of the hospital; but it may be permissible to suggest that in these difficult days even greater discretion and consideration than usual is needed in assessing the circumstances of a patient who attends armed with a note from practitioner to specialist.

THE BACTERIOPHAGE IN TREATMENT

THE attractive simplicity of d'Herelle's early thesis, that the bacteriophage might be used as a benign parasite to wage war upon pathogenic organisms for the benefit of man and beast, obtained many adherents at the time of its publication and for years afterwards. A great variety of maladies, including typhoid, dysentery, cholera, septic conditions, and pasteurella infections—to mention only a few of the range—have been treated by this agent. The results obtained have been so contradictory as to suggest to the unbiased and non-technical observer that once again a vaunted remedy is undergoing the slow and painful process of discredit. Clinical observers are wont to be unduly optimistic where the judgment of a therapeutic agent is concerned, and to let their critical faculty lie dormant until it is forcibly aroused. One who looks back over the literature of four or five decades and notes the waves of enthusiasm with which a whole succession of remedies were hailed and subsequently discarded, recognises all too clearly the process through which the bacteriophage seems to be passing. We have consistently urged trial on a large scale, under controlled conditions, as the only means of settling its place in therapeutics, but not even in fiction or filmland has this trial been carried out, though Mr. Sinclair Lewis's hero, Martin Arrowsmith, at least defined the problem in dramatic terms. But, apart from field trials, some interesting evidence is available which calls in question the ability of the bacteriophage to produce lysis of organisms within the tissues. I. Dresel and M. R. Lewis [1] have found its activity to be inhibited in the presence of fresh tissue, so that no destructive action could be demonstrated upon bacteria in tissue cultures. Attention has recently been drawn [2] to experiments made by E. Friedberger and J. Vallen [3] ten years ago, but receiving little notice at the time, by which it was shown that bacteriophage action could produce a hæmolytic mutant from the ordinary non-hæmolytic variety of *B. typhosus*. Hæmolytic strains of *B. typhosus* have also been cultivated from the blood and stools, and found to be resistant to bacteriophage action. It is of course well known that one effect of the bacteriophage upon bacteria is the production of resistant mutants, which have at times been shown to be of greater virulence than the unaltered parent strains. It is interesting to recall that L. S. Dudgeon [4] and his co-workers have insisted upon the occurrence of hæmolytic varieties of *B. coli* in cases of cystitis, and have maintained that such organisms are associated with infections of a particularly severe type. Bacteriophage therapy has been tried in many infections but without much success, and N. W. Larkum [5] has shown that the phage may be present spontaneously in the urine at some period of most acute urinary infections. It would be interesting to know if the hæmolytic strains described by Dudgeon are lysogenic or resistant to lysis; should they be resistant, this fact would afford striking evidence of the impotence of the bacteriophage under the conditions prevalent in this infection. In any case it is quite clear that the simple view of the phage as a kind of bacteriostatic antiseptic, which may be used for the destruction of bacteria in vivo, is not a correct one.

Sir Holburt Waring, consulting surgeon to St. Bartholomew's Hospital, has been elected President of the Royal College of Surgeons of England in succession to Lord Moynihan. The vice-presidents are Mr. W. Sampson Handley and Sir Percy Sargent.

IN a leading article last week (p. 135) on the ætiology of megalocytic anæmias we spoke, at the foot of the third paragraph, of vitamin B_2 as the possible extrinsic factor necessary for interaction with the gastric juice to form an essential neurological principle. This should read as vitamin B_1. Drs. Strauss and Castle have demonstrated that vitamin B_2, or some closely allied body, is the extrinsic factor concerned in hæmopoiesis, and postulate that vitamin B_1 is possibly the extrinsic factor having an analogous significance for the central nervous system.

[1] Amer. Jour. Hyg., 1930, xi., 187.
[2] Jour. Amer. Med. Assoc., April 2nd, 1932, p. 1190.
[3] Klin. Woch., 1923, ii., 1649.
[4] Jour. Hyg., 1924, xxii., 346.
[5] Jour. Bact., 1926, xii., 203, 225.

SPECIAL ARTICLES

WHAT IS WRONG WITH THE MEDICAL CURRICULUM?

(A Series of Opinions Contributed by Request)

VII

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There are two aspects of the medical curriculum which are of special interest to the psychologically minded physician. In the first place the curriculum aims at a certain end, and lays down a method whereby the student's mind is to be moulded so as to achieve that end. To determine whether the method is adequate to its aim some consideration of the nature, possibilities, and modes of functioning of the mind is obviously necessary, and the psychologist ought to be able to contribute something of value to the elucidation of this problem. In the second place psychological processes play a part in the causation and treatment of disorder, in some disorders a very important part, and the psychologist must naturally inquire whether the curriculum enables the student to achieve a practical knowledge of those processes.

AIM OF THE CURRICULUM

With regard to the first problem it is generally agreed that the aim of the curriculum is to make a good doctor, but this definition will not help us to establish a suitable curriculum unless the essential characteristics of a good doctor can be precisely understood and enumerated, and here we shall immediately meet with considerable divergences of opinion. It is often assumed that the one necessary characteristic of a good doctor is that he should be thoroughly grounded in the method of science, so that he may apply that method naturally and surely to all the problems which he has to meet. The excellence of this aim in itself is, of course, beyond question, but whether it covers all the field which should be covered is another matter. A good scientist does not necessarily make a good doctor, although a bad scientist will certainly make a bad one. The practice of medicine is said to be at once a science and an art, and a thorough grounding in scientific method hardly meets all the requirements of the artist.

Medicine to-day certainly cannot be described simply and solely as a science, however desirable it may be that it should strive continually to become one. At present it is a queer mixture of science, empiricism, and tradition, in which the practitioner has to find his way, partly by holding firmly to the weapon of scientific method, but partly by other weapons about which he has been taught nothing, although he gradually acquires a rough-and-ready dexterity in their use. Amongst these other weapons is pre-eminently a practical understanding of man as an individual, and not merely as an uninteresting vehicle containing some fascinating disease processes. This aspect has been delightfully depicted by Dr. C. M. Wilson when he speaks of the doctor gradually acquiring "a stock of worldly wisdom built upon a growing discernment of the ways of human nature, so that soon he is as cunning in the management of men as he is helpless in the control of their diseases." [1]

[1] Brit. Med. Jour., 1932, i., 485.

Now the psychologist will certainly hold that something of this necessary knowledge of human nature can be taught, and not merely left to be picked up casually in the school of experience. Moreover, he will be inclined to amend Dr. Wilson's statement, and to maintain that a doctor possessing an adequate knowledge of human nature will by that very fact become far less helpless in the control of diseases because they will be viewed in their proper perspective as partial processes in an integrated individual.

The task which the doctor has to face is therefore a highly complex one, and we may now ask how far the medical curriculum prepares him for those particular factors which have just been enumerated. Firstly, how does it meet the circumstance that medicine to-day is not a pure science?

The student in his earlier years is occupied with subjects in which the method of science is rigidly followed, and the lines of thought which he acquires, or should acquire, by his study of physics, chemistry, and biology, he finds equally applicable and efficient when he passes on to human anatomy and physiology. At this stage his mind is set to move on to medicine as a natural continuation of these same lines of thought, and he confidently expects to find there the rigid employment of scientific method to which he has by now become thoroughly accustomed. He expects to find medicine a pure science, but instead he meets at its threshold with a bewildering change of values. He can discern the road of scientific method leading steadily onwards and opening up an ever-widening territory, but this road no longer stands by itself as the only possible route. It is crossed and often almost obscured by other paths, fashioned by empiricism and tradition, with which he has hitherto had no practical acquaintance. If he has learnt intelligently he will know something of empiricism as a preliminary and transitory stage in scientific method, legitimate enough so long as its nature and limitations are thoroughly understood, and of tradition as an obstacle to be dealt with by the sternest scepticism. But he is not in the least prepared for the way in which these factors will make their appearance in the study of practical medicine, nor for the plausible masks they will often wear under the names of "clinical experience" and "clinical acumen." Under these stresses the student's values tend to become confused and distorted, and his mind gradually accumulates a mass of material in which the *dicta* of his elders, unimpeachable examples of scientific method, and the most flagrant manifestations of *post hoc ergo propter hoc*, uncomfortably jostle one another. Finally, he is in imminent danger of losing altogether that grasp of scientific method which he once so painfully acquired, and of manifesting processes of thought which would fill the veriest tyro in science with incredulous amazement.

INSTRUCTION IN METHODOLOGY

The remedy for this state of affairs would seem to be fairly obvious. It is, of course, useless to demand that medicine should be immediately purged of its empiricism and tradition, and wholly forced into the mould of a pure science. It is indeed very questionable whether such a procedure would be sound even were it feasible, but in any case it certainly is not feasible at the present day. Medicine is a practical affair, the doctor has to act, and often to act on probabilities, inferences, and even "intuitions," which the scientist would regard as insufficient for

any action at all. It is necessary for the doctor to do these things, but it is not necessary for him to do them blindly. He should have acquired a clear knowledge of all the weapons which he will have to use, their merits and demerits, their relations to the method of science, how much value they may possess, and for what ends.

The curriculum fails here because it begins by conducting the student carefully along a road which he believes stretches indefinitely before him, and then at the end of the pre-clinical years jolts him suddenly on to another road without adequate warning or preparation. The remedy evidently is to see that he gets this warning and preparation, and that he has been taught, not only the essentials of scientific method, but also something of empiricism and tradition, so that when he meets these factors he will be able to discern them, to evaluate them correctly, and to estimate how far he may legitimately employ them in arriving at practical decisions. Dr. F. Dillon has suggested [1] that methodology should be taught as a definite subject in the curriculum, but whether it is explicitly so taught or not, the student must certainly acquire a grasp of its essentials in his bones if he is going to find his way clearly in the tangled paths of medicine.

It may be asked why it is more necessary for the medical student to learn the principles of methodology than for the student of physics or chemistry. The latter does not need such special instruction because the principles of scientific method are gradually but surely welded into his being by the simple process of studying his subject. In the medical student, however, this steady progress is partially broken and distorted when he passes into clinical medicine, and unless he has clear lights whereby he may then sail he will cease to be either educated or educable.

THE PATIENT AS AN INDIVIDUAL

Next it may be asked how far the curriculum helps the student to achieve an understanding of man as an individual, and that "discernment of the ways of human nature" which is so obviously an indispensable part of the armoury of every competent physician. The requirement here is that the student should learn practical psychology, and it is so clearly a necessity that probably no one will dispute its desirability. A divergence of opinion can only arise on the question as to how far it can be taught, and here negative views are often explicitly, and still more often implicitly, held. We may be told that practical psychology as a body of communicable knowledge does not exist, that the psychology of the schools has no relation to the actual problems of life, that it is merely a playing ground for warring sects, and that the student must be left to acquire what he can by the aid of common sense and experience. It is certainly true that the student does in fact manage to acquire a great deal of such practical knowledge, and the capacity in this direction of the competent general practitioner often arouses the admiring amazement of the consultant. Nevertheless the criticism we have mentioned is not any longer valid, though it was not far beside the mark half a century ago. In spite of the indubitable divergences amongst its schools, modern psychology can offer much help to the physician, and enable him to find his way more surely and understandingly through the problems which beset him.

There are some psychological processes which figure so largely in everyday medicine that it seems almost incredible that a student should be allowed to become qualified without having been taught one single thing about them at any stage of his career. Take, for example, the processes grouped together under the name of "suggestion." It must be apparent to the intelligent student that these are omnipresent, that they may play a part in the conduct of almost every case, and that they are necessarily used, blindly or with knowledge, by every practitioner. Yet he is taught nothing of their nature or potency, and perhaps only hears "suggestion" occasionally referred to with a tolerant smile as something with a flavour of the disreputable still clinging to it, and without relation to *real* disease or doctors. Now we know to-day a great deal about suggestion and its possibilities, and it is surely imperative that the student should have a clear knowledge of its nature and mode of action, so that he may be able to estimate correctly the part it is playing in the clinical pictures presented by his patients and in the procedures whereby he seeks to cure them, and be able to use it, if he thinks it desirable to use it, in the full light of deliberate intention and understanding.

It were easy to multiply similar instances, and the psychologist can unquestionably show solid ground when he asks that some training in psychology should be an integral part of the curriculum. This contention can be well maintained upon grounds which concern the whole field of medicine, but its weight will be greatly increased when we take into account certain departments of medicine in which the psychological factor occupies a dominant position. To the consideration of this second section of our topic we must now turn.

THE PSYCHONEUROSES

The conditions which until recently were called functional nervous disorders, but which are now more generally termed psychoneuroses, constitute a large and important group, whose ætiology has been the subject of many theories throughout medical history. Regarded at one time as manifestations of possession by spirits, at another as the result of undisciplined wanderings of the uterus about the body, they were assigned in a later and more enlightened age to functional disturbances in the nervous system, a theory which allayed the scientific conscience though it gave no help in the practical understanding or management of a very troublesome group of disorders. In recent years this theory has been displaced by the view that the psychoneuroses are predominantly psychogenic, that whatever other factors may be involved psychological factors play an essential part in the causation. It is beyond question that the psychogenic theory offers a far better understanding of these disorders, and a far better foundation for appropriate therapeutic action than has ever before been achieved. Possibly, of course, the psychological factors concerned may ultimately be analysed into or expressible in physiological and chemical terms. There is, however, but little indication of such a possibility at the present time, and the doctor, who has to be a practical person, must make use of weapons which are undoubtedly effective, however much he may cherish hopes of ultimately replacing them by others.

Moreover, the field of disorder in question is a very wide one, and inevitably bulks largely in every doctor's practice. Nevertheless, the student during his hospital career is unlikely to appreciate the magnitude of the problem with which he will subsequently have to deal, and tends rather to think

[1] Brit. Med. Jour., 1932, i., 631.

of the psychoneuroses as comparatively rare disorders with which he need not seriously concern himself. This misconception rests upon a number of causes. In the first place, the psychoneuroses are probably relatively less frequent in hospital than in private practice, though their actual incidence amongst hospital patients is considerably greater than is generally supposed. Secondly, these patients are not congregated together, but are spread over every department of the hospital, according to the particular organs with which the symptoms happen to have become associated. This circumstance arises from the insistent need to fit the symptoms into an organic framework, a demand fed on the one hand by the prejudices of the patient, arising from the intrinsic nature of a psychoneurosis, and on the other hand, by the prejudices of the doctor, arising from those very limitations of his training which are now under discussion. In these various departments the cases are labelled "functional" and, ipso facto, cease to arouse further interest. The student comes to regard "functional" as denoting a mixture of imagination and perversity, unworthy of the serious attention of the physician, but to be placated by bromides and a vague employment of electrotherapy. This lack of interest is natural enough, because the particular organ or organs for whose alleged offences the physician has been consulted, are, in fact, found to have nothing particular the matter with them. The patient, however, has got something the matter with him, but something which can only be found by studying him as an individual striving to adapt to his internal and external circumstances, and failing to adapt in just those particular ways which we term psychoneuroses. He is certainly ill, but his illness can only be understood by taking into account psychological as well as physiological factors. Not infrequently, of course, the student will be fortunate enough to meet with a physician who will take these aspects into consideration, but the systematic instruction and background which will enable the student to derive a real profit are lacking. And thirdly, because the student has been taught no framework in which to fit these cases, he does not discern them, just as the doctor of a century or so ago did not observe that general paralytics formed a definite class amongst the mass of demented asylum patients until his eyes had been opened by learning the characters of the disease for which he had to look.

It is with regard to this third point that the psychologically minded physician has serious reason to criticise the curriculum as it stands to-day. In view of the wide prevalence of psychoneurotic disorders it is surely desirable that the student should be taught something about them, and something of modern views of their nature and treatment. The essential requirement is not that he should acquire an extensive knowledge of the psychoneuroses, but that there should be included as an integral part of his education the building of a platform upon which this special knowledge can ultimately be erected. The average student probably learns very little ophthalmology during his medical course, but his whole education has been so fashioned that he can become an ophthalmologist by simply adding further storeys to the platform he has acquired. So far as the psychoneuroses are concerned, however, this platform is almost entirely lacking. The student has been taught no psychology, and nothing of the part which psychological processes may play in the causation and treatment of disorder, and without some training in these lines of thought he has nothing upon which to build.

Training of this kind would, moreover, have a far greater value than merely enabling the student to observe intelligently cases of the psychoneuroses. If he understands the meaning of psychogenic causation, and its application to particular forms of disorder, his conceptions of the nature of disease will necessarily become wider, he will appreciate the possibility of approaching the problems of medicine from more than one angle, and he will be less subject to the cramping shackles which technical education so often brings in its train. In a word it will help him to think more freely. It is not, of course, implied that he should be taught the psychological aspects of medicine by a further dumping into his mind of authoritative *dicta*, but he should learn that there are such aspects, and that there are modes of approach to medical problems from this side which he must be prepared at least to consider. He should be encouraged to accept nothing without satisfactory ground, for the reasoned scepticism of the scientific mind is the most precious possession he can acquire; but he must also acquire the ability to distinguish and assess the prejudices which so often masquerade in its name.

From the standpoint of the psychologist there are therefore two aspects in which the curriculum is open to criticism. On the one hand it fails to prepare the student for his future career in that it does not give him a clear understanding of the weapons he will have to use. This failure, and the inevitable confusion of thought and method to which it gives rise, is responsible for part at least of that defect in the educational level of our profession which recent critics have so much deplored. On the other hand, the curriculum omits any adequate instruction in practical psychology, so that the student acquires no knowledge of a very extensive field of disorder, and no platform upon which he may ultimately build up that knowledge. It is true, of course, that some medical schools make gallant efforts to meet these needs, but they are isolated attempts, and they are not incorporated as they should be in the essential structure of the curriculum.

THE HISTORY OF ANÆSTHESIA:

A VALUABLE EXHIBITION

THE historical section of the museum of the Royal College of Surgeons of England, which grows in size every year, has recently been enriched by a collection of early anæsthetic apparatus made by the late Dr. Dudley W. Buxton, which has now been presented to the museum by his son, Mr. St. J. D. Buxton, F.R.C.S. This collection, which has unique features, covers the history of the apparatus employed for administering anæsthetics for a period of over eighty years, and covers it comprehensively. The early age of anæsthesia by narcotics is represented by an example of the "sleeping sponge" or spongia somnifera of Hugo, of Lucca, which was described by his son, Theodoric, in 1490. This consisted of a sponge saturated with a strong decoction of opium, hyoscyamus, hemlock, mandragora, and unripe mulberries, mixed with the seeds of lettuce, dock, and water-hemlock. These were boiled with the sponge, which, when it had absorbed the liquid, was allowed to dry. For use, the sponge was dipped in hot water for an hour and then applied to the nostrils of the patient who was to be operated on, and left there until he had fallen asleep. The procedure must be deemed to have been disappointing, as it fell into disuse.

The first piece of apparatus of which we have a description was that called "letheon," invented by W. T. G. Morton, a type of which was used for administering an unnamed drug at the first operation under the new anæsthetic, which was performed by Dr. J. C. Warren at the Massachusetts General Hospital on Oct. 16th, 1846. A model of this, together with one of the apparatus devised by William Squire, by means of which ether was first administered to a patient at University College Hospital, London, on Dec. 21st, 1846, has been added to the Dudley Buxton collection. This was the occasion when Robert Liston amputated a man's thigh who, when he regained his senses, was unaware of what had happened. Following these we have the apparatus devised by Snow in 1847. Until that year no really scientific apparatus had been invented for administering ether. But Snow was earnest and shrewd in all his work; he re-commenced his researches, and in 1848 published his "Experimental Paper on Narcotic Vapours." About the same time he perfected his well-known chloroform inhaler which, with modifications and improvements, remained in use for many years.

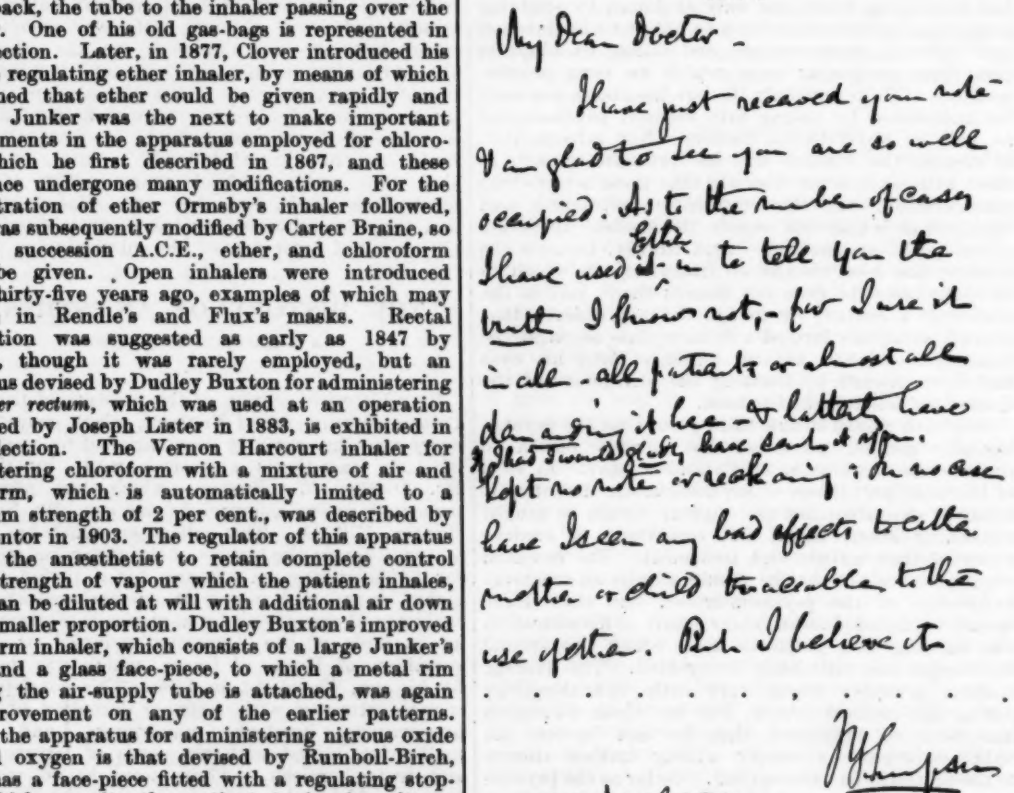
Following Snow came Clover who, in 1862, published an account of his chloroform apparatus by means of which he regulated the percentage of vapour administered. For minor operations Clover found that nitrous oxide gas given by his apparatus answered best. His gas-bag, which was of large size, was carried on the back, the tube to the inhaler passing over the shoulder. One of his old gas-bags is represented in the collection. Later, in 1877, Clover introduced his portable regulating ether inhaler, by means of which he claimed that ether could be given rapidly and safely. Junker was the next to make important improvements in the apparatus employed for chloroform which he first described in 1867, and these have since undergone many modifications. For the administration of ether Ormsby's inhaler followed, and it was subsequently modified by Carter Braine, so that in succession A.C.E., ether, and chloroform might be given. Open inhalers were introduced about thirty-five years ago, examples of which may be seen in Rendle's and Flux's masks. Rectal etherisation was suggested as early as 1847 by Pirogoff, though it was rarely employed, but an apparatus devised by Dudley Buxton for administering ether *per rectum*, which was used at an operation performed by Joseph Lister in 1883, is exhibited in the collection. The Vernon Harcourt inhaler for administering chloroform with a mixture of air and chloroform, which is automatically limited to a maximum strength of 2 per cent., was described by the inventor in 1903. The regulator of this apparatus enables the anæsthetist to retain complete control of the strength of vapour which the patient inhales, and it can be diluted at will with additional air down to any smaller proportion. Dudley Buxton's improved chloroform inhaler, which consists of a large Junker's bottle and a glass face-piece, to which a metal rim carrying the air-supply tube is attached, was again an improvement on any of the earlier patterns. Among the apparatus for administering nitrous oxide gas and oxygen is that devised by Rumboll-Birch, which has a face-piece fitted with a regulating stop-cock which permits the patient to inspire nitrous oxide or oxygen, or a combination of those gases in different proportions.

In nitrous oxide gas apparatus both Dudley Buxton and Frederic Hewitt effected many improvements, examples of which are shown in the collection. Several specimens of apparatus are shown illustrating methods used for administering ethyl chloride and bromide, also Roth-Dräger's apparatus for ether and chloroform or a combination, in definite doses, or with oxygen. Mention should also be made of Ehrenfried's apparatus for intrathoracic insufflation anæsthesia for air and ether. This rather complicated invention has a water-jacket for warming the gases before they enter the lungs. Other types of inhalers and masks included are those of Probyn Williams, Skinner's with flannel frames, Protheroe Smith's, Colman's, and many others, which, together with a collection illustrating various types of gags, sufficiently show the comprehensive character of a collection which will prove invaluable to the student of the history of medicine, and should attract the interest of numerous visitors this week.

SOME LETTERS FROM SIR JAMES SIMPSON

We have received from Mr. St. J. D. Buxton three original letters which were in the possession of his father. They had been addressed to Dr. R. Protheroe Smith by Sir James Simpson. Protheroe Smith, physician to the Hospital for Women, Soho-square, and formerly lecturer on midwifery at St. Bartholomew's Hospital, had a large midwifery practice, and the originator of an ingenious type of inhaler (v. supra). Two of Simpson's letters are undated, the second, reproduced partly in facsimile (Fig. 1), is dated April, 1847, the year when Snow's

FIG. 1

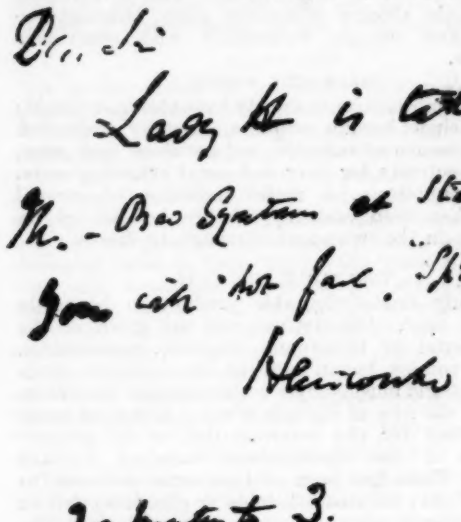

My Dear Doctor -
I have just received your note
I am glad to see you are so well
occupied. As to the number of cases
I have used it - in order to tell you the
truth I know not, - for I use it
in all - all patients or almost all
labours it has - & latterly I have
left no note or reckoning: In no case
have I seen any bad effects to the
mother or child traceable to the
use of it. But I believe in
22 April 1847

apparatus for the administration of ether appeared. Simpson's third letter has two terminations.

The other facsimile letter is from the Earl of Hardwicke to Dr. Protheroe Smith. Its date is

November, 1847, and the envelope is endorsed "1st Chloroform Case in London" (Fig. 2).

FIG. 2



DEAR SIR,
Lady H. is taken ill—Bad symptoms at starting—You will not fail. "*Speed.*"

HARDWICKE.

20 Minutes to 3.

The following is the text of the three letters from Simpson :—

I

MY DEAR DOCTOR,
The inclosed was written a week ago—and I thought Dr. Keith had sent it off—but he had slipped it out of the packet. I have been going on etherizing :—and see no result but good—great good. But I am sure some of the instruments will *asphyxiate* our patients. I have seen several *very pretty* ones that no one could breathe with.

This week I saw an unique case in Obstetric Annals. A child at the 9th month passed *without* operative assisstance through a pelvic outlet 2¼ inches long and ¼ of an inch broad! I inclose a cut of the hole through which I afterwards pulled the child—the hole being cut out of an iron plate. Now there is a puzzle for you. The child was 18½ inches long. I reckoned on nothing less than the Cæsarean Section. Osborne's case of Sherwood was (I *now* believe) quite true and correct.

References to Midwifery Etherzn.

Monthly Journal of Medicine for Feb., p. 639, for March, p. 718, for *April* (but I cannot get the No.) In it you will find two long communications under Obstetric and Medico-Chirg. Societies. In the first I anticipated all Dubois' conclusions except one. In the last I describe the inst. I use. Kindest regards to Rigby.

I have scribbled some nonsense on Pl. prævia for the Lancet.

Yours,
J. Y. S.

II

MY DEAR DOCTOR,
I have just received your note and am glad to see you are so well occupied. As to the number of cases I have used Ether in to tell you the *truth* I know not,—for I use it in all—all patients, or almost all, *demanding* it here—and latterly have kept no note or reckoning. If I had I would *gladly* have sent it you. In no case have I seen any bad effects to either mother or child traceable to the use of ether. But I believe it requires care and management. Of course it will be *strongly* opposed and for years. I have lately diverted myself by looking over all the arguments against vaccination at its introduction. They are exactly the same as those now urged against ether—viz—the alleged production of disease—deaths (one man, Probey, published 218 deaths from vaccination!—*post* not propter)—and etc., and etc. Lately I had a letter from Retzius of Stockholm about it. He says that our good Creator wd. not have concealed it so long from us if it had the alleged effect. It is a dangerous argm.—and bears above equally agt. vaccination.

What I am labouring after is now to find out the counter-indications to its use. For what constitutions should we not use it? I was highly diverted by Dr. Tyler Smith's arguments agst. it—about it stopping labour by removing volitions etc. *Practically* it does not stop it—at least in its last stages. You will find (in addition to my paper) a series of remarks on it in the Monthly Journal, and especially the deduction I drew on it on the 15th Feb. at our Obstetric Society. I will inclose the references. Have been suffering today from a horrid headache.

Yours ever truly,
J. Y. SIMPSON.

22 April 1947
P.S. I have been thinking of writing a short note on the Ether to the Medical Gazette. Would it do any *good*?
J. Y. S.

III

MY DEAR DOCTOR,
My clerk has written you the preceding copy—which I have sent off to 30 or 40 hospitals. I believe *not* so many die after amputation with ether as without it—but we shall see. I have notes of 25 ether amputations of the thigh; 7 died—or 1 in 3. Usually 2 in 3 die.

Your Essay was a very good and well digested one. Never mind Dr. Tyler Smith and this Spectator trash. If it were worth while I would sit up some night and give him a drubbing—but I think he doesn't deserve notice.

I am always using the ether—and always now easily—and with more success.

I inclose a paragraph which may divert you. Theological not medical.

The amputation investigation is the result of a promise to the Medico-Chirurgical Society here. I hope to get 100 amputation cases or more and analyze them all.

Yours ever,
J. Y. SIMPSON

and by thus collecting, on the whole, a large body of statistical data, I hope to be able to arrive at some interesting general results.

Begging again many apologies for thus venturing to intrude upon you, I have
the honour to remain
very faithfully yours
Dr. Protheroe Smith. J. Y. SIMPSON.

DEFEATING A CORNER

Morton's attempt to conceal the drug that was used in the "letheon" apparatus was unsuccessful. He tried to keep the nature of the anæsthetic secret, securing a patent for it, and calling it "letheon." But the odour of the vapour revealed its identity, and the nature of Morton's anæsthetic was at once communicated to London.

THE BRITISH PHARMACOPŒIA, 1932

A DETAILED STUDY

(*Concluded from p. 163*)

Additions

BY far the most important aspect of the new book is the number (128) and character of the substances which the Commission has added. Bacterial preparations, animal products, and organic arsenicals have been introduced.

BIOLOGICAL PRODUCTS

Bacterial products include antitoxins of diphtheria, tetanus, and gas gangrene; anti-dysentery serum; Schick control, diphtheria prophylactic, and Schick test toxin. Most of these and a number of somewhat related substances are already controlled in this country by the Therapeutic Substances Act, and a caution is given that the provisions of any law controlling the product must be observed. This provision applies also to pituitary (posterior lobe) extract, the only form of pituitary now included. This preparation is standardised by a biological method of assay, described in Appendix XV., to

contain 10 units per millilitre, the dose being expressed both in units with a maximum of five and in millilitres (0·5). In future, pituitary extract must be used not later than 18 months after the date of manufacture. Detailed instructions are provided for the preparation of a solution of insulin, the strength of which is determined by biological assay, and for tablets which may be dissolved in water to form a hypodermic injection. It is enjoined that a preservative equal to 0·5 per cent. *w/v* of phenol must be added. The spirochæticidal arsenicals added are neoarsphenamine and sulpharsphenamine (the American nomenclature will be noted), and both are subject to biological tests for undue toxicity and for therapeutic potency.

DYES

Four dyes, acriflavine, indigo-carmine, iodophthalein and methylene-blue, are now official substances. No dose is given to the first, and its absence may be considered as an indication that the parenteral injection of this substance in cases of sepsis is not established. Confusion has arisen in the past as to the correct strength of indigo carmine to inject for the determination of renal efficiency, and at least one case is on record in which 4·0 per cent. (actually a suspension) was administered. The Pharmacopœia now sets a standard for its solubility, 1 in 100, and prescribes doses for subcutaneous or intramuscular (grs. ⅛ to 1½) and for intravenous injection (gr. ⅛ to ¼). The intravenous dose is much less than the corresponding dose (5 to 10 c.cm.) of a 1 per cent. solution which is frequently given. The reason is not clear for the omission from this monograph of the directions for preparing a sterile solution which appear in other monographs on substances administered only by injection. Iodophthalein (di-sodium tetraiodophenolphthalein) used in cholecystography, must pass a rigid assay for iodine, of which the compound contains 61 to 62 per cent. The oral dose is 0·04 to 0·06 g. per kilo body-weight up to 5 g. By intravenous injection up to 3 g. (grs. 45) may be administered. In this and in other cases ampoules containing solutions for injection must comply with stringent tests for alkalinity of glass, yet no test is prescribed to control the acidity or alkalinity of the large amount of the dye that is to be injected to produce a shadow.

LOCAL ANÆSTHESIA

New local anæsthetics include amylocaine hydrochloride (trade name, stovaine) for which doses are given for subcutaneous (gr. ⅛ to ¼) and intrathecal (grs. ½ to 1½) injection and also for oral administration, although the number of times this ester has been given by the mouth must be very few. Benzocaine, useful as an analgesic to the nasal mucous membrane, has a dose of grs. 5 to 10. Orthocaine and procaine hydrochloride have received recognition, being widely used.

HYPNOTICS

Soluble barbitone (sodium veronal), carbromal (better known by the trade name of Adalin) and phenobarbitone with its soluble sodium salt (equivalent to luminal and luminal sodium) are important and well-known hypnotics that now must comply with the new and comprehensive standards.

GASES

Probably no substances in the book are required to pass such stringent tests as the four new gases—carbon dioxide (limits of sulphur dioxide, carbon monoxide, phosphine, and sulphuretted hydrogen); ethylene (carbon dioxide and monoxide, sulphur dioxide, acid, sulphide, &c.); nitrous oxide (carbon monoxide and dioxide, sulphuretted, arseniuretted, and phosphoretted hydrogen); oxygen (carbon dioxide, chlorine, and acid). It is obviously wise to introduce tests for the absence of noxious gases, although the makers now comply voluntarily with equivalent standards.

DIAGNOSTIC AGENTS

Two diagnostic agents already have been mentioned; others include barium sulphate, carefully controlled for the absence of sulphide, and lævulose and urea, used respectively for liver and renal efficiency tests. Soluble fluorescein, a useful indicator of corneal lesions, has been added, probably because of its recent use in the treatment of malignant disease.

VEGETABLE PRODUCTS

The only crude vegetable product to be made official is agar. Descriptions still are given of the raw material of belladonna, digitalis, ipecacuanha, and nux vomica, but in addition the powdered drugs are defined and must comply with alkaloidal standards, except in the case of digitalis where a biological assay is prescribed for the determination of its activity in terms of the International standard digitalis powder. There has been of late some reversion to the belief that isolated alkaloids or glucosides fail to produce effects equal to those obtained with the prepared drugs; the Commission evidently has taken this possibility into consideration in laying down standards for these powdered drugs.

INORGANIC ARSENIC PREPARATIONS

Two liquid preparations of arsenic, liquor arsenicalis and liquor arsenici hydrochlor., were included in the British Pharmacopœia 1914. These have now been replaced with an arsenical solution, still known as Fowler's solution, with an identical arsenic content, but possessing the advantage of compatibility with both acids and alkalis. This fact is not made clear in the book; here and in a few other places a note drawing attention to new possibilities arising from alterations such as that introduced under liquor arsenicalis might have been supplied with advantage. It should be noted that the new preparation is colourless and odourless.

EYE OINTMENTS

Both prescriber and dispenser are helped here by the description included under the heading "Oculenta" (ointments for the eye) of a basis which must be used in making all ointments intended for ophthalmological use, and by reference to specific strengths of medicaments which must be supplied when the proportion of the drug is omitted from a prescription.

The basis consists of a mixture of yellow soft paraffin and wool fat, sterilised at 150° C. for one hour, and from the individual occulenta described, it is evident that the Commission has a preference for the preparation of eye ointments with the salts of atropine, cocaine, and other alkaloids rather than the alkaloidal bases.

If this preference be due to the results of experiments in which the comparative values of mydriatic and myotic *alkaloids and their salts* have been determined, then the Pharmacopœia has done a good service in rationalising the preparation of ophthalmic ointments of these substances.

A commonly held view that the lipoid-soluble alkaloids are more active as mydriatics than their salts may require revision in the light of these recommendations. It may be noted that the pharmacist is required, if no strength be given on a prescription—e.g., for oculentum cocainæ—to dispense an ointment containing 0·25 per cent. of cocaine hydrochloride. Actually he may not do so (for the product would

be a dangerous drug) unless the letters B.P. are included and the total quantity of the preparation stated.

The same argument applies to the case of suppositories of morphine which now are merely stated to contain a quarter-grain of the hydrochloride.

INJECTIONS

A useful group of injections now replaces the simple hypodermic solutions of the last edition. It includes injections of precipitated bismuth metal suspended in a medium of dextrose solution and preserved with cresol; a suspension of bismuth salicylate in olive oil with camphor and phenol; an injection of iron citrate, included presumably on account of its use in secondary anæmia, but of doubtful value in these days when massive doses of iron are considered necessary; mercurial cream containing 10 per cent. of mercury in wool fat and olive oil with the addition of camphor and creosote; calomel cream (5 per cent. calomel); and an injection of gum acacia on the lines advocated by the late Sir W. M. Bayliss for intravenous injection in the treatment of surgical shock.

STERILE SOLUTIONS

Full directions are given in Appendix XVI. for the preparation of sterile solutions. The methods admitted are: Heating in an autoclave at 115° to 116° C.; Tyndallisation at 80° C. for one hour on three successive days; filtration; in the case of oily solutions heating to 150° C. for one hour; and an emergency method in which aseptic methods are used and phenol 0·5 per cent. or corresponding concentration of another equally effective antiseptic. Solutions prepared by the last method must be used within four days and no antiseptic should be added to solutions intended for intravenous injection.

A footnote reads, "In any emergency in which the methods described above cannot be applied, it is the duty of the dispenser to inform the prescriber that complete sterilisation cannot be attempted, and to obtain the prescriber's approval for the method to be adopted."

VITAMIN D AND LIVER EXTRACT

Only one vitamin product has been included. This is a solution of vitamin D, standardised by the determination of its curative effect upon rats that have been fed on a rachitogenic diet, and of its prophylactic potency by a similar assay. The doses and strength correspond to those commonly associated with commercial preparations. Although it is held that there is no very close relationship between the vitamin A value of cod-liver oil as shown by biological assay and the intensity of blue colour produced by the antimony trichloride test, yet this test is included for cod-liver oil and full directions are given in Appendix XIV. for conducting it. The Pharmacopœia contains, however, no statement that cod-liver oil must comply with a definite standard of vitamin A or D potency.

A solid and a liquid extract of liver have been rendered official. Though no method of biological assay has yet been evolved, pharmacopœial directions for storage by the chemist are supplied and a standard is based on an equivalent of fresh liver. The liquid extract contains in each fluid ounce the equivalent of ½ lb. of fresh liver, and in one tube of the dry extract there is an amount equal to the same quantity of fresh substance.

ERGOT

The new preparations of ergot—ergot itself with a minimum alkaloidal content (0·05 per cent.); a defatted powdered ergot (0·1 per cent. alkaloids); ergotoxine ethanosulphonate; and liquid extract of ergot prepared on the lines of the U.S.P., should now be considered in the light of Chassar Moir's recent work.[1]

INFUSIONS

Recognition is now given to the common practice of using concentrated infusions, the only exception being infusion of digitalis which must not be dispensed when more than twelve hours old. In common with the other digitalis preparations it is made from standardised powder, and should contain 6 units of activity in 4 fluid ounces, which is the maximum dose. This is eight times the maximum dose of the 1914 preparation, but it should not be assumed that the infusion is one-eighth the strength of the older preparation. The dose has been adjusted to modern ideas regarding digitalisation.

IODINE SOLUTIONS

Three solutions of iodine are now official. They are no longer known as "tinctures," but are termed "liquors" or "solutions." Liquor iodi fortis contains 10 per cent. and liquor iodi mitis 2·5 per cent. of iodine in potassium iodide solution. Liquor iodi simplex is a simple solution of iodine in alcohol and resembles the tincture of iodine of the 1908 French Codex, but contains slightly more iodine.

DISTILLED WATERS

If the prescriber requires a *distilled* aromatic water, such as that of cinnamon or peppermint, to be dispensed he now must specify his requirements on the prescription, otherwise the chemist is at liberty to supply either the distilled water, a solution made by dissolving the essential oil in water or a dilution of a concentrated preparation. Sterilised distilled water and sterilised water for intravenous injection may in future be commercial commodities, for methods of preparing them are included for the first time in the book. In the latter case the water must be used within 24 hours of its distillation.

CERTAIN OTHER ADDITIONS

The following list indicates briefly some other substances now added which are of interest:—

Cinchophen (trade name Atophan) with a dose of grs. 5 to 15, but without any cautionary notice regarding prolonged or uncontrolled administration; dilute erythrol tetranitrate, a preparation containing equal parts of the vasodilator and lactose; hydnocarpus oil and a preparation of its ethyl esters used as an injection in the treatment of leprosy; industrial methylated spirit, now permitted for the official liniments and other preparations; magnesia cream, a useful suspension of magnesium hydroxide; mercury oxycyanide with a maximum dose of gr. ¼ for intramuscular or intravenous injection; strophanthin, a mixture of glucosides standardised biologically by comparison with an international standard of ouabain, and having a dose of gr. 1/240 to 1/60; simple ointment, a mixture of wool fat with hard and soft paraffin, which replaces most of the ointment bases of the previous edition; compound syrup of ferrous phosphate (Parrish's or chemical food) now standardised to definite iron and calcium contents, with the result that a complete revision must be made of existing formulæ, and a number of cheap and comparatively worthless preparations which are on the market must be discarded; thryoxin-sodium, standardised to contain 61 to 65 per cent. iodine, and having a dose of gr. 1/640 to 1/64; and totaquina, introduced at the instance of the Health Committee of the League of Nations, and consisting of a mixture of the crystallizable cinchona alkaloids of which not less than one-fifth is quinine.

The following additions will require no comment; some should have been added at the time of the last revision:—

Amidopyrine, antimony sodium tartrate, caffeine sodium benzoate, carbon tetrachloride, chloramine, chlorbutol, Dakin's solution, dextrose, emetine hydrochloride and bismuth iodide, ephedrine hydrochloride, extract of malt and extract of malt with cod-liver oil, ichthammol, quinidine sulphate, Unna's paste, and zinc paste.

[1] See THE LANCET, 1932, i., 1373.

MEDICINE AND THE LAW

Medical Witnesses under the New Procedure

WHEN the Rules Committee of the Supreme Court drew up new rules of procedure for certain classes of litigation [1] it naturally did not overlook the running-down or collision cases which frequently require the presence in court (sub pœna) of the general practitioner, with all the delay, uncertainty, and annoyance which such attendance implies. Under these rules the judge may remit to a special referee the estimation of the extent and permanence of an injury alleged to have been caused by the negligence of a motor-driver. The referee, who will probably be a doctor, will make a report which both sides are entitled to see, but need not accept, and which will be available for the assistance of the judge. As Mr. F. W. Beney suggested in a recent lecture to the Solicitors' Managing Clerks' Association, the referee may see fit to examine the injured person in the presence of the doctors of both sides; this should make it possible for all the medical men to agree, and save the necessity for any of them being called as a witness. If this power is properly used, it should do away with most of the medical evidence in cases involving personal injury, and save medical men a great deal of time.

A Coroner's Criticism

Anomalies which arise from the holding of inquests on deaths associated with anæsthesia have on more than one past occasion aroused controversial opinion and the suspicion that all was not well with these inquiries. It has become clear, moreover, that the very necessity for inquiry is not acknowledged on the same grounds by all coroners. That is in itself a step in the right direction, for everyone in full possession of the facts knows that in a large number of deaths associated with anæsthesia there is no sense in holding an inquiry at all. In these instances, commonly furnished by patients brought to hospital desperately ill or terribly injured and given the one slender chance of life by emergency operation, no question can arise in connexion with the surgeon and anæsthetist which can be profitably discussed by a coroner, still less by his jury. The cause of death is plain and is apart from the activities of surgeon and anæsthetist. There is no question of negligence, carelessness, or malpraxis.

Some coroners have quite fully realised these occurrences and have acted accordingly, with a laudable saving of time and of possible damage to reputation of the medical men concerned. Consideration of this last possibility is not always present in the coroner's mind. Looking, however, at his omnipotence in his own court, his freedom of speech and the impossibility of due reply, the coroner should be careful to weigh his words. His is a court of inquiry. He should not make it appear to be one of arraignment. Above all we may surely demand that if a coroner airs his opinions on any special matters it should be plain from those opinions that he is fully conversant with recent knowledge and practice. At an inquiry recently conducted into the facts of a death which occurred at the Evelina Hospital for Children, according to reports in the lay press, the coroner criticised the practice of allowing the laryngeal reflex to be abolished by the anæsthetic during an operation for removal of the tonsils, because of the danger of entry of blood to the larynx. The coroner was evidently unaware that the surgeon who removes tonsils to-day takes precautions, by the mode of anæsthetic administration, by the position of the patient, or by the immediate control of any bleeding that arises, to prevent blood from entering the air passages. The complete deliberate removal of tonsils as carried out to-day requires an absence of all gagging and a perfectly immobile pharynx, and this implies a degree of narcosis in which the laryngeal reflex is always abolished. In the days when the tonsils were removed speedily a much lighter anæsthesia was all that was needed or asked for from the anæsthetist. No doubt it was operations of this kind that the coroner had in mind when he observed that he had done the operation hundreds of times and never had the laryngeal reflex abolished. The advance of knowledge with regard to this particular operation has led to a complete instead of an incomplete removal of the offending tonsil. Complete removal of tonsils cannot be properly carried out without a degree of narcosis that involves abolition of the laryngeal reflex, and unless anyone is prepared to denounce the modern operation he cannot fairly criticise the anæsthesia it involves. And before he denounces the modern operation he would be well advised to do a little follow-up work on his hundreds of patients and find out how many of them have had to undergo a second operation for removal of the portions of tonsil which he left behind.

A Maternity Case

An action was tried at the Greenwich County Court at the end of June, in which a married woman and her husband alleged negligence against a registered nurse and certified midwife who was the proprietress of a nursing home where, amongst others, maternity cases were received. In April, 1931, arrangements had been made, on the advice of her medical attendant, for the married woman to enter the nursing home for the expected birth of a child in October, a booking fee of two guineas being paid. The defendant, of whose experience, personal care, and ability the county court judge was satisfied, seems to have thought it safe to be absent from the nursing home for a long week-end at the beginning of October, having had no holiday since the previous April. She was mistaken. The patient was brought to the home in the absence of the proprietress, and a child was born in circumstances which suggested inattention. The nurse in charge had experience of general nursing, and had a special certificate from a fever hospital, but was not a maternity nurse, nor a certified general-trained nurse. She did not send for the doctor, and, in the words of the county court judge, "she left the unfortunate plaintiff roaming about the room by herself at the very time when the child was born." The plaintiffs claimed damages for breach of contract as well as for negligence. They said the proprietress of the home had undertaken to give personal attention to the case. The judge held that she had merely said, "I always do my best to be present"; her absence was therefore no breach of contract. But she had held herself out as carrying on maternity work amongst other cases, and she was under an absolute duty to leave some competent person in charge who could deal with maternity cases. The patient was brought to the hospital at 2.30 A.M., and the child was born at 6.30 A.M. In the judge's opinion a competent nurse would have known that birth was near; not being a certified midwife, the nurse in charge ought to have sent for the doctor, though the proprietress herself would not have needed to trouble the doctor at that hour. The defendant, said the judge, must bear the loss occasioned by the

[1] See THE LANCET, 1932, i., 996.

incompetency of the person whom she left in charge. On the question of damages, the judge observed that the patient was of a bright and cheerful disposition, and happily all was well in the end, but she was entitled to something for the very serious mental anguish she endured when her child was being born in the circumstances described. He awarded ten guineas damages. In a second action in which the proprietress of the nursing home sued the patient's husband for £24 11*s*. 3*d*. for professional services rendered to the patient, judgment was given for £24 0*s*. 9*d*., with costs.

Dead Cats and Dogs

A man was fined 10*s*. at Sheffield last week for throwing a dead cat into the canal. The solicitor for the canal company told the court that the medical officer of health had frequently complained of the nuisance caused by the bodies of dead animals. The company had had to pay extra wages for clearing the canal of them. During the week ending June 18th, 29 bodies of animals (including a pig) were taken from the canal; during one week last March as many as 32 cats and dogs were taken out. The defendant's excuse was that he had nowhere else to throw the cat—a statement which shows that it is necessary not only to prohibit the throwing of dead animals into rivers and canals, but also to educate the public to use the facilities provided for disposal of refuse. There are probably plenty of people in Sheffield and elsewhere who think that the river or the canal is the only place for dead dogs and cats, although our public health enactments have for many generations aimed at preventing nuisances and protecting sources of water-supply. In 1876 the Rivers Pollution Prevention Act prohibited the putting of putrid solid matter into a stream; 250 years previously, the New River Company's charter had forbidden the casting of "dogs, cats or any cattle, carrion or any unwholesome or unclean thing" into what was then already one of London's sources of water-supply. Indeed, as long ago as the year 1388, an Act "for the punishment of them which cause corruption near a city or great town to corrupt the air" had recited that "so much dung and filth of the garbage and entrails as well of beasts killed as of other corruptions be cast and put in ditches, rivers and other waters . . . nigh unto divers cities . . . that the air there is greatly corrupt and infect and many maladies and other diseases do daily happen." Yet the canals near our cities and great towns are still receiving their half-dozen dead cats or dogs a day.

IRELAND

(FROM OUR OWN CORRESPONDENT)

APPOINTMENTS BY LOCAL AUTHORITIES

By the terms of the Local Authorities (Officers and Employees) Act, 1926, the Appointments Commission set up under the Act was given power to recommend for appointment to an office under a local authority one person or, if they should think fit, two or more persons from whom the local authority might select. From the date of the establishment of the Commission until a few months ago it was the unbroken practice to recommend only one person for each appointment. The virtual appointment was, therefore, in the hands of the Appointments Commission. Soon after the coming into office of the present Government the personnel of the Commission was changed, and recently the practice as to recommendations has also been changed. It is now the custom of the Appointments Commission to send three names to the local authority in each case, the final choice to rest with the local authority. On the face of it this seems a proper enough procedure. But, unfortunately, it tends to run counter to the intentions of the Act. The Act was based on the conviction that local elective authorities were not in their nature well fitted to estimate profesional or technical qualifications, and, secondly, on the experience that many local authorities made their appointments on the grounds of family and political influence and personal favour. The increased power now restored to local authorities is likely to lead to a return to methods of choice which have nothing in their favour. As regards medical appointments the change is open to the further objection that it puts a stop to the policy of centralising the medical services, a policy the natural end of which would have been a State Medical Service.

THE LATE DR. GRAHAM

Dr. James Graham, coroner for the city of Belfast, died on June 15th, in his 80th year. Born at Boardmills, Co. Down, he was educated at the Queen's College, Belfast, and took his M.D. degree in 1872. He started practice in Belfast, where he soon became an outstanding figure in the city. His first entry into public life dated from 1885, when he was elected chairman of the Lagan Pollution Committee, and in 1888 he became an alderman of the corporation and was elected chairman of the public health committee. It was during this period of his chairmanship that a scheme for the establishment of a municipal hospital for the treatment of infectious diseases, advocated ten years previously, was brought to completion, from which emerged the magnificent institution which now occupies part of the old Batt estate of Purdysburn, which was acquired by the corporation and which now also houses the municipal mental hospital. He was elected president of the Ulster Medical Society in 1899.

In 1905, Dr. Graham was appointed coroner, and during the years in which he filled the office he conducted innumerable inquiries with dignity and tact. He brought to bear an intimate knowledge of medical science which helped to solve many a knotty problem, and his urbanity, savoir faire, and good sense successfully surmounted many difficulties. He could make allowances for the frailties of human nature, and where some would have administered reproof or punishment, Dr. Graham often met the case with a few words of kindly and helpful advice.

INDEX TO "THE LANCET," VOL. I., 1932

THE Index and Title-page to Vol. I., 1932, which was completed with the issue of June 25th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, London, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

EAST LONDON CHILDREN'S HOSPITAL.—A lantern lecture on Surgeons of Other Lands was given to the nursing staff of this hospital by Prof. G. Grey Turner on July 13th. The lecturer was introduced by Prof. E. W. Hey Groves, and a vote of thanks was proposed by Sir Cuthbert Wallace and seconded by Mr. Warren Low.

CORRESPONDENCE

WHAT IS WRONG WITH THE MEDICAL CURRICULUM?

To the Editor of THE LANCET

SIR,—Dr. Batten's contribution to this series is most interesting and stimulating because it aims not at further loading of the curriculum but at developing the mind of the student and enhancing his general culture. Dr. Batten's frankness in pointing out the deficiencies of the average medical man is refreshing. He rightly emphasises the evil of insensate cramming, to the detriment of thought and originality.

While the old apprenticeship system had its admitted evils, to the student who was fortunate in his master opportunities were offered which few students to-day can ever meet. Not only did the apprentice obtain an intimate clinical experience of the types of cases he was himself going to treat later on, but a wise and experienced practitioner could, by the intimate nature of the relationship, provide countless pegs on which the student might hang his increasing knowledge. His opportunities were comparable with those of the few who are fortunate in having medical parents. Teachers tell us that no factor influences the progress of a youth of average ability more than the opportunity at home for informed "table talk."

It has long seemed to me that a desirable innovation, without adding to the curriculum—indeed, by its mordant effect actually easing the burden—would be to hold a course of informal lectures, of a tutorial type, comprising those subjects the teaching of which is at present left to chance and which as a rule the unfortunate student has to pick up as best he may after qualification. The course should be optional as an experiment. I feel certain it would be well attended. Its success would depend on the choice of lecturer, who would require to be a man of wide general experience and great personality. The gift of knowing the mind of the struggling student by recollecting his own difficulties would be an essential qualification. As the ground covered would be extensive, probably a small team of lecturers would be desirable. Perhaps a weekly lecture throughout the winter session in the fifth year, and fixed for a convenient hour after the regular lectures, would be sufficient, the course to be described as "Medical Practice" or some such non-committal term. I have in mind informal talks, with opportunity for question and discussion, on such things as common ailments, emergencies, personal hygiene, the "specialties" commonly dealt with by the general practitioner, "tips" only learned at present in practice and not found in books. Then there are those mysteries about which there has been such a conspiracy of silence in the past—sexual difficulties, breast-feeding and the general handling of babies, common ailments, and disorders of women. Add to these, precepts in the conduct of practice, medico-legal difficulties, the working of the Insurance Acts; the whole given in quite an informal way and interlarded with incidents from actual experience.

I feel sure that in the hands of the right man such a centre for the stimulation of thought and the coördination of knowledge would be a great success and, in after years, it would be to those occasions that the mind of the practitioner would hark back in his many difficulties rather than to the formal lecture or the text-book.

I am, Sir, yours faithfully,

WM. B. WATSON.

Town Hall, Croydon, July 18th, 1932.

SERUM TREATMENT OF PNEUMONIA

To the Editor of THE LANCET

SIR,—I have been surprised that no comment has appeared in your correspondence columns on the report published in your issue of July 2nd by Dr. Cowan and his colleagues at the Glasgow Royal Infirmary upon the use of serum in pneumonia. Clinical evaluations of Felton's serum in this country on a scale comparable with those appearing in America are so rare that one would have expected some notice to have been taken of what appear to me to be serious omissions in the report. It is nowhere stated, for instance, what quantity of serum was used (except that the "average dose has been 3·6 ampoules per patient"); nor, alternatively, its value in mouse protection units; nor whether the serum was always given intravenously; nor whether typing of the cases was always done from sputum or from blood or lung-puncture fluid (the only reliable material when the sputum is not hæmorrhagic). More important is the lack of detail concerning the criteria used for the diagnosis of pneumonia, an essential preliminary to a proper appraisement of the results.

It is difficult to understand why, when the authors were apparently unable to observe any clinical improvement in Type II. cases treated with serum, nor any diminution of mortality in a series of 45 serum-treated cases, they should recommend that serum should be available for treatment. They do indeed state that they consider their series still too small for accurate conclusions, but they do not hesitate to ascribe the small mortality, in their series of 44 Type I. cases, to the use of serum. Finally, they have used as controls contemporary cases in other Glasgow hospitals, but they have also apparently not given serum to 18 out of the 155 cases at the Royal Infirmary which formed the basis of their experiment. No reasons are stated as to why serum was not given to these cases, a most important point, since the slightest bias in selecting cases for such a series must help to invalidate the conclusions arrived at.

I am, Sir, yours faithfully,

DUNCAN LEYS, M.D. Oxf.

Selly Oak Hospital, Birmingham, July 14th, 1932.

THE INHERITANCE OF DISEASE

To the Editor of THE LANCET

SIR,—A wide knowledge of the literature on inherited defects convinces one that the same disease may in some families be transmitted as a dominant—that is, it does not appear in children unless one of the parents was similarly affected—while in other families it is passed on by those who have no trace of the defect themselves and in whose family there may be no other evidence of it, thus behaving as a recessive.

Are we to understand that if we had all the information correct, the two families would be seen to

exhibit the same type of transmission? Such an assumption is unjustifiable, and leads us nowhere. We merely ignore much that is helpful in the elucidation of the problem. If we assume, however, that the appearance of any one defect or disease is dependent upon factors carried in the chromosomes, and that such factors are not necessarily all bound up in one gene but may be present in 50 genes, the problem becomes somewhat simple.

Let us suppose that the disease, diabetes mellitus, depends upon the presence within the chromosomes of 50 different genes. If any one of these be lacking, the disease does not manifest itself. Now in one family, suppose that all 50 genes are present in one chromosome, which we designate by A. If the parent passes on A, then the child develops diabetes; if the allelomorph, A′, is passed on, the child is normal. In this family, then, diabetes will be transmitted as a dominant character.

But let us consider another family. In this case we will assume that only 40 of the necessary genes are present in chromosome A, so that no diabetes is recognisable. In the course of years, a person with this combination of genes mates with a person who has present in chromosome A the 10 genes that were lacking in him. Naturally this mate did not show diabetes either. Now if the proper combination of chromosomes be made, the chances for the combination being one in four, then the offspring will have diabetes. It will occur in the offspring of parents both of whom were normal. It will thus act as if due to a recessive. Yet in each family the disease was dependent upon the same 50 genes. It is apparent that in the second family a person with the disease cannot transmit it to his offspring, since both chromosomes with the 40 and the 10 genes cannot go into the same mature germ cell. Passing it on will again depend upon an appropriate mating to supply some of the missing genes.

Suppose that the 50 genes which were to cause the disease were located not in one chromosome, but in two, and that the two were not mates of a pair. Then 20 might be in chromosome A and 30 in chromosome B. Now a person with both A and B in their make-up would show diabetes. The chances would be one in four that both A and B would be transmitted together to any one child. If they were, and if in turn that child passed on both A and B, there might be diabetes going through one branch of the family as a dominant, appearing in every generation, and not showing in offspring whose parents did not have it.

But consider the children who received A and not B, or B but not A. They would not have diabetes, since they lacked the full complement of chromosomes, but if the one with A mated with a person who had B, or one with B mated with one with A, then their offspring would show the disease. This would be very apt to happen if cousins from the affected stock were to marry. Looking at such a pedigree then, the conclusion would be obvious that the disease was not due to a dominant character, since unaffected persons passed it on. Therefore the assumption would be made that, in each instance in which it had descended in the direct line, there must have been a mating with a person who carried the defect latent, a conclusion that is of course false.

The variations encountered should convince the student of human genetics that merely to examine and analyse a few typical pedigrees thoroughly will not in the least answer the problems of inheritance. It is true that in those illustrations just chosen the same disease was dependent upon the same 50 genes, but the modes of transmission were not the same in any of the cases.

If this is true, then says the student: "What is the use of studying pedigrees at all? It appears that any disease may be inherited in any way." This seems to be largely borne out by observation, for we find the same clinical entity being transmitted in one family as a dominant; in another as a recessive, and in a third as recessive, but linked with the sex chromosome; while in still others there is an erratic mode of inheritance that suggests that it may be due to multiple factors as in the last theoretical case of diabetes discussed. Many in the family will exhibit the disease, but its appearance is more or less sporadic. Despite this inability to predict how the disease is inherited in general, a study of the family history usually gives a fair idea of how it is being transmitted in that particular family, and so enables the physician to give advice to them concerning their immediate problems.

There are some diseases—such as hæmophilia, which so far as we know is inherited only as a sex-linked recessive, or Huntington's chorea, which seems to be universally a dominant—that appear to follow the same laws of transmission in all families. There are some diseases which seem to follow one type of transmission very much more frequently than they do others. Thus the excessive numbers of males over females with pseudo-hypertrophic muscular dystrophy is due no doubt to the fact that in most instances it is passed on as a sex-linked recessive. That it may not always be so is evident from the fact that there are females who are typical cases of the disease but whose fathers were not affected—a condition incompatible, so far as we know, with the appearance of a sex-linked recessive disease in a female.

We will be able to bring order out of chaos, not by concentrating only on a few pedigrees of a disease, but by taking into consideration all which we find. Inaccuracy of observation by the physician or of reports by the family will obscure the problem often, it is true; but we will attain to a more complete knowledge of a very complex subject only as we physicians report every case of inherited disease which comes under our observation. Clinical details may be exactly like those of hundreds of other cases reported in the literature, but the hereditary aspects are important for themselves. If this were done, we could with more assurance state that such and such a disease is inherited as a dominant in such a percentage of cases; that it behaves as if due to a recessive in some other percentage. We could then make more intelligent statements to our patients.

At present we must not be too dogmatic concerning the type of inheritance of any disease or defect. They may range in their mode of transmission through every conceivable combination, so that on the one hand they are obviously due to a "Mendelian dominant," or on the other hand they are so rare in their appearance that we really have no proof that they are inherited at all.

I am, Sir, yours faithfully,

MADGE THURLOW MACKLIN.

University of Western Ontario Medical School, London, Canada.

STREPTOCOCCAL SEPTICÆMIA

To the Editor of THE LANCET

SIR,—Dr. Smith's letter raises the following points:

(1) Were his two cases primarily influenzal? This appeared necessary to his argument in order to show that the resistance of his second case was lowered. Since he now states that a throat swab of this case, taken within the first 24 hours, showed hæmolytic streptococci it appears more probable that both cases were of primary streptococcal throat infection, the second case becoming septicæmic. It is unfortunate that in neither case was the organism typed.

(2) Although he has not referred to the four instructive cases described by Rosher and cited by us, Dr. Smith will now agree that we referred to other cases than septicæmia due to scarlet fever, and that there is evidence of the benefit from serum in certain of these cases, whether the action of the serum is specific or otherwise.

(3) He appears to believe that if a case of septicæmia shows infection of the lung and

pericardium (as ours undoubtedly did, vide the clinical history and skiagram) this is a "localisation" of the disease, and actually assists in recovery. I do not think this view is accurate. The advent of pneumonia in a case of, e.g., puerperal septicæmia is of grave significance, and a fatal result almost invariably follows. His own case, which developed a lung infection and died, is against his belief.

(4) Dr. Smith believes that "uncomplicated" cases of septicæmia, if given good nursing, &c., "will develop more resistance, more antibactericidal as opposed to antitoxic power, if they are not given serum." In other words, that serum is directly harmful to such patients while complicated cases demand serum therapy. I should like to know what proof Dr. Smith has to support his belief. My view is that the most hopeful thing in the treatment of septicæmia would be the production of a highly specific antibacterial, as well as antitoxic serum. If Dr. Smith's views are correct, such a serum should not be administered to uncomplicated cases, while if it was given to complicated ones, he might still argue that the case had recovered because of the complication or localisation, and not because of the serum.

I am, Sir, yours faithfully,

A. H. G. BURTON.

Public Health Offices, Ilford, July 15th, 1932.

"SECRETION OF MUCUS BY THE TRACHEA"

To the Editor of THE LANCET

SIR,—In your issue of July 9th is an interesting annotation on the tracheal cells which secrete mucus, as they have been lately studied by Prof. H. Florey and collaborators. "In animal experiment," it is stated, "it was found that a more intense irritation of the trachea caused the columnar and goblet cells to be replaced by a stratified epithelium similar to that of the urinary bladder."

The same thing occurs in man, and was described by me in the *Glasgow Medical Journal* (1891, xxxv., 266), an illustration of the condition being given. Certain very peculiar inflammatory lesions of the bronchi as they occurred in a lung which was the seat of two gangrenous cavities communicating with one or more bronchi, and with the pleura, are minutely described. The bronchi to the naked eye could be classed in two principal groups. After describing the first group, the characters of the second group are declared to be still more remarkable.

"The normal epithelial layer was replaced by a compound squamous epithelium resembling that of the skin. The deepest cells were short columnar or polygonal, and there seemed to be no basement membrane. Several rows of short polygonal cells existed above this, and in some places club-shaped or pyriform cells, like those seen in the bladder. . . . It might naturally be imagined that the bronchial membrane, when subjected to peculiarly offensive irritation, would protect itself in this way. Such was the explanation which seemed satisfactory to Dr. Coats, in examining the sections submitted to him."

I am, Sir, yours faithfully,

Harley-street, W., July 13th, 1932. A. G. AULD.

ŒDEMA OF THE LARYNX

To the Editor of THE LANCET

SIR,—A propos of Sir James Dundas-Grant's letter in THE LANCET of July 16th and your annotation of July 9th, the following passage from the *Prognostic XXIII* of Hippocrates is not without interest: "Angina is very serious and rapidly fatal, when no lesion is to be seen on either throat or neck, and, moreover, it causes very great pain and orthopnœa; it may suffocate the patient even on the first day, or on the second, third or fourth." (The translation is by Prof. W. H. S. Jones, Loeb Classical Library.)

This twenty-third section contains a terse but wonderfully accurate clinical account of various forms of severe angina.

I am, Sir, yours faithfully,

E. W. GOODALL.

West Hampstead, N.W., July 19th, 1932.

DOUBLE APPENDIX

To the Editor of THE LANCET

SIR,—Having read a report of the case of Tudor *v.* Mein, Prof. O. Margarucci, of the Policlinico Umberto, Rome, has asked me (as he does not write English) to send a short note on a case of double appendix lately operated on by him. During the course of the operation, which was for acute gangrenous appendicitis, a second appendix was discovered, totally separate and complete in itself. The diseased appendix was attached normally; the second started from the lowest portion of the cæcum, lay on the anterior wall of this, and was in contact with the gangrenous appendix. Both appendices possessed a mesentery, and the diseased one was well developed. The healthy appendix measured 3·5 cm., was cylindrical in shape, with its extremity slightly swollen, its lumen was pervious, and its muscular and mucous layers normal. Prof. Margarucci excludes the possibility of any other pathological condition—e.g., a diverticulum of the wall of the cæcum. Other references to such a condition can be found in the *Centralblatt für Chirurgie*, 1929 (lvi., 1346), by Prof. Braatz, and 1930 (lvi.,3123).

I am, Sir, yours faithfully,

PHILIP GREEN, M.D.

35, via Ludovisi, Rome, July 16th, 1932.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Lt. J. J. Keevil to be Surg. Lt.-Comdr.

S. J. Savage to be Surg. Lt.

The following appointments are notified: Surg. Capts. N. S. Meiklejohn to *Vivid*, for R.N. Barracks; and F. L. Smith to *Victory*, for R.N. Barracks.

ROYAL NAVAL VOLUNTEER RESERVE

Proby. Surg. Lt. W. G. MacLean to be Surg. Lt.

Proby. Surg. Lt. (D.) R. D. Daly to be Surg. Lt. (D.).

Surg. Lts. A. S. Pearson and J. F. Corr to *Victory*, for Haslar Hospital; W. Gough (proby.) to *Concord*; and D. D. Craig (proby D.), to *Victory*, for Haslar Hospital.

ROYAL ARMY MEDICAL CORPS

Capt. A. M. Simson to be Maj.

TERRITORIAL ARMY

Capt. W. U. D. Longford (late R.A.M.C., S.R.) to be Capt.

Lt. F. H. C. Beards, from 6th Bn. R. War. R., and T. C. Williams to be Lts.

TERRITORIAL ARMY RESERVE OF OFFICERS

Lt.-Col. H. G. L. Haynes, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Lt. J. A. Kerr, from active list, to be Lt.

INDIAN MEDICAL SERVICE

Lt.-Col. D. P. Goil to be Col.

Capt. H. J. Rice to be Maj.

ROYAL AIR FORCE

J. F. Dales is granted a short service commission as a Flying Officer for three years on the active list.

Dental Branch.—D. I. Malcomson is granted a non-permanent commission as a Flying Officer.

HONORARY PHYSICIAN TO THE KING

Maj.-Gen. H. C. R. Hime, D.S.O., late R.A.M.C., has been appointed Honorary Physician to the King in the place of Col. J. C. Kennedy, C.B.E. (late R.A.M.C., retd.).

PANEL AND CONTRACT PRACTICE

The Medical Service Subcommittee

THE medical service subcommittee is one of the three statutory subcommittees of an insurance committee, and before it are laid all complaints made by anyone against any insurance doctor for the area. It only has power to initiate the withholding of money from a doctor's recommendation after substantiation of a complaint, and its decision has to be confirmed by the main committee. The complainant may be the insurance committee itself, any approved society official on behalf of his or her society, any patient or friend or relative, but in the latter two cases the patient has to forward a certificate that the complaint is laid with his knowledge and consent; moreover, under the regulations if a complainant brings a charge against an insurance doctor, and subsequently decides to withdraw that complaint, the case may still go on for investigation by what is termed "a reference." The matter is then brought to the notice of another subcommittee, usually the medical benefit subcommittee or the main committee; they pass a resolution asking the medical service subcommittee to investigate the case and the investigation continues. This procedure sounds possibly vindictive and unfair. Neither the medical benefit nor even the main committee is a judicial body, balanced for the trial of complaints, yet it only has to be mentioned that a complaint has been made by anyone for a resolution to be passed for the investigation to be carried on; but it has regretfully to be recorded that cases are not unknown in which an insurance doctor has approached a complainant with the endeavour to square the case financially, rather than appear before the medical service subcommittee for its investigation. Hence the reason for this "reference" regulation.

This medical service subcommittee consists of an equal number of lay representatives and medical men with a chairman who must be one of the neutral members of the main committee—i.e., he must represent the Ministry of Health, or the County Council, and he must be neither a medical man, nor a representative of insured persons. The medical service subcommittee elect naturally their own chairman, but if there be no member of the main committee thought suitable for the post among the neutral members, arrangements can be made with agreement of both sides—i.e., doctors and representatives of insured persons—to coöpt on to the main committee someone for the express purpose of acting as such chairman. The chairmanship entails much work and knowledge of the regulations to enable its occupant to fulfil his duties impartially. Tact as well as common sense are necessary in dealing both with doctors, who are often rightly annoyed at an inquiry being held, and with insured persons, who will put any sort of grievance forward to justify their complaint. The evidence given is not on oath, but either side has the right of appeal against the insurance committees's decision to the Ministry of Health, and these appeal cases are heard usually with a barrister as chairman, and a medical man as another member of the court, often both officers of the Ministry of Health. Legal help is not allowed before the medical service subcommittee, but evidence is on oath and legal assistance is permitted before the appeal tribunals.

The report from the medical service subcommittee to the main committee is made in a certain way. After stating the nature of the complaint it narrates the evidence given by the witnesses and finally it states what it finds as fact. For example, it may say "the insured person said the doctor did not visit again until the 11th, the doctor said he visited on the 4th, we have inspected the book, prescriptions, &c., and we find as fact that the doctor did visit on the 4th." It concludes the report with a recommendation to action. Here the main committee is often in a difficulty if it wants to disagree with this recommendation, for it is bound by the finding of facts; for instance, it is not competent to discuss the question, in the hypothetical case quoted above, whether the doctor did or did not visit on the 4th. The main committee usually endorses the medical service subcommittee's recommendations, but it sometimes increases the amount of money which is suggested as a suitable sum to be withheld by the Ministry. The form of words used is: that the Minister of Health be asked to withhold a portion of the money payable to the committee in respect of medical benefit with a view to the deduction of a corresponding amount from the remuneration of the respondent practitioner. This is essentially a fine but it is not called a fine, it is supposed to represent in money the difference between what a doctor is entitled to receive if he carries out completely his agreement with the insurance committee—i.e., his terms of service—and the standard to which he has allowed himself to fall by failing to keep these terms.

Probably the most severe decision that a medical service subcommittee can arrive at is that the continuance of the particular practitioner on the panel is detrimental to the interests of the service. This decision is usually accompanied by the advice to withhold money. Before a doctor can be removed from the panel the Ministry of Health has to set up a special committee of inquiry to go into the facts and any other matters which the Ministry may like to investigate as telling either for or against the practitioner. It is not easy to get a doctor removed from the panel. He may be guilty of one or even more pieces of negligence, but it would probably need evidence of persistent disregard of his duties which would cause this special ministerial inquiry committee to advise the Minister of Health to remove his name. This special committee does no more than advise removal or otherwise. If it reports to the Minister that, whilst this case is proved against the practitioner by the medical service subcommittee, yet it is not deemed sufficiently grave to advise removal from the panel, the Minister will withhold money in accordance with what is thought just after considering the medical service subcommittee's suggestions.

Such a special ministerial inquiry has recently been held at the instance of the Lancashire insurance committee. The doctor was alleged to have allowed his dispenser to issue over 1200 prescriptions and certificates of incapacity in his name. Out of 3268 certificates or prescriptions issued for panel patients, between January and September, 1931, the doctor himself signed only 1841. The defence apparently was that these forms were signed only under the doctor's directions. The doctor said he was very busy and did not know he was doing wrong; he did not know until last November that he ought not to have issued a certificate of incapacity unless he had examined the patient on that day or within 24 hours. The dispenser had never issued an initial certificate of incapacity though he had signed

intermediate ones. The inquiry committee will report its finding to the Minister. The case would appear to illustrate the dangers of letting familiarity with the wording of the certificate forms ("I hereby certify that I have examined you on the undermentioned date") induce forgetfulness of their literal meaning.

Representative Views at the Brighton Congress

In an address to the Congress of the Royal Sanitary Institute, held at Brighton last week, Sir William Hart, town clerk of Sheffield, set himself to examine whether national health insurance was advancing or receding. The various parts of the machine are, he said, at work unobtrusively but effectively, and he felt that, in spite of statements to the contrary made in Parliament, insured persons did realise the advantages the system confers. Mr. Arthur Greenwood, a late Minister of Health, had observed a desire on the part of insured persons to obtain something to which they were not entitled; an unfortunate idea which vitiated most social legislation to-day, and was tending to destroy the spirit of independence of which we used to be so proud. It was this spirit, Sir William remarked, which encouraged wrongful certification, but, he added, that in itself was not likely to lead to a breakdown of health insurance. Whilst financial stringency may check the development of national services, Sir William regards the extension of benefits to dependants, and the setting up of specialist and consultant services, as essential requirements. The period of set-back should be used for the preparation of a uniform scheme in all the health services with the active support of contributory organisations, statutory and voluntary.

Mr. J. W. Shaw, gen. sec. of the Druids, dealt with the problem of administration. Approved societies must, he said, get their full contributions income, for effective administration required a sufficiently large office accommodation and an expert and trained staff in all departments. The smallness of the amount available for administration expenses was an inevitable handicap to the smaller societies. Of the 17 additional benefits scheduled in the 1928 Act many were not available owing to financial difficulties; the most popular of them were dental, ophthalmic, convalescent home, hospital, medical and surgical appliances—in that order. With regard to married women it was, he said, the view of responsible administrators of all types of approved societies that legislation was necessary to stop the drain on the funds by married women. He concluded by saying that the British health insurance scheme is a model to the world.

Mr. W. M. Marshal, secretary of the Scottish Association of Insurance Committees, spoke of the medical treatment of the sick poor. Recent changes in local government had increased the responsibility to local health authorities and raised the question of a possible State medical service. But the insurance service as it stood was, in the main, satisfactory. On the medical side, with few exceptions, the service was good; on the statistical and certification side he thought there was much room for improvement. Medical treatment should be extended to dependants, the charge on State funds being sufficient to ensure central control. Local authorities should, he thought, allow free choice of doctor at the capitation rate of payment for attendance on the sick poor. The present shortage of hospital beds was at least partly due to lack of facilities for diagnostic investigation on the part of the general practitioner. The establishment of centres for X ray, electrocardiograph work, test-meals, and so forth would raise the standard of the medical service and reduce the demand for hospital provision—and it would not cost very much. He was told the day of the bottle of medicine was passing, but last year over 50,000,000 prescriptions were issued in England and Wales. Drugs in England cost 1s. per head more than in Scotland. He suggested a saving on drugs should go hand in hand with the establishment of diagnostic clinics. He criticised the tendency of public authorities to appoint whole-time staff for each additional duty, pointing out that experienced general practitioners would do the clinical work better. On the whole the disadvantages of a State service outweighed the advantages, for in a free service the first duty of the doctor is to the patient, who ought always to be his primary concern, whereas in a State service the doctor's duty would be to his chief, an entirely different matter.

Insurance and Benevolence

At a meeting of the Paddington Medical Society held on July 12th, Dr. F. C. Martley gave an account of the principles and development of insurance, contrasting the relative advantages of sickness, endowment, and life assurance. The importance of sickness insurance to a medical practitioner was now freely recognised. It should, he thought, be more fully realised that endowment and life assurance, in addition to their other advantages, were an excellent if indirect auxiliary to the work of medical charities, in so far as they reduced the strain upon the limited resources of such benevolence.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 9TH, 1932

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 35 (last week, 22); scarlet fever, 1448; diphtheria, 658; enteric fever, 68; acute pneumonia (primary or influenzal), 634; puerperal fever, 35; puerperal pyrexia, 87; cerebro-spinal fever, 36; acute poliomyelitis, 3; encephalitis lethargica, 9; dysentery, 5; and ophthalmia neonatorum, 84. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 12th–13th was as follows:—Small-pox, 49 under treatment, 5 under observation; scarlet fever, 1429; diphtheria, 1373; enteric fever, 18; measles, 1190; whooping-cough, 391; puerperal fever, 17 (plus 7 babies); encephalitis lethargica, 230; "other diseases," 95. At St. Margaret's Hospital there were 16 babies (plus 11 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 30 (13) from measles, 2 (1) from scarlet fever, 27 (13) from whooping-cough, 25 (8) from diphtheria, 43 (29) from diarrhœa and enteritis under two years, and 17 (5) from influenza. The figures in parentheses are those for London itself.

Of the deaths from measles 9 were reported from Liverpool and 2 each from Gateshead and Birmingham. Three fatal cases of whooping-cough were recorded in Liverpool and 3 in Sheffield. Diphtheria accounted for 3 deaths in Liverpool, 3 in Manchester, and 2 in Leeds. Four of the deaths attributed to influenza were reported from Birmingham and 2 each from Salford and Sunderland.

The number of stillbirths notified during the week was 260 (corresponding to a rate of 37 per 1000 total births), including 42 in London.

LADY PLENDER MEMORIAL WINDOW.—Last week Sophy, Lady Hall unveiled memorial windows in the board room of the Elizabeth Garrett Anderson Hospital, to the late Lady Plender who was associated with the hospital for over 20 years.

PUBLIC HEALTH SERVICES

ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH

THE following are 1931 statistics of two boroughs, one burgh, four urban and four rural districts :—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 live births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality in childbirth.
Cambridge B. (67,000)	11·6	11·2	0·60	1·91	1·5	1·8	44/22	14	3·9
Watford B... (56,500)	14·6	9·2	0·65	1·42	1·3	1·6	52/31	—	1·2
Kilmarnock B. (38,099)	19·7	13·2	0·60	1·44	2·9	1·7	69/17	46	6·6
Edmonton U.D. ... (77,720)	17·5	10·0	0·72	1·28	1·6	2·5	53/—	16	2·9

Registered stillbirths per 100 live births: Cambridge 4·5 (notified), Watford 5·3, Kilmarnock 4·2 (notified), Edmonton 2·8.

Cambridge

Dr. Andrew J. Laird says the birth-rate was the lowest ever recorded in Cambridge, being only 0·4 higher than the death-rate. An immunisation clinic against diphtheria was begun in May, 1930, the number immunised up to the end of the year being 300. In 1931 96 children only were immunised, the decrease being partly due to the extraordinary decline in diphtheria. During the five years from 1927 onwards the notifications of diphtheria numbered 82, 143, 240, 105, and 47, with 8, 16, 10, 7, and 2 deaths respectively. During the last ten years in Cambridge there have been 8 deaths from scarlet fever, 14 deaths from measles, and 25 from whooping-cough. During the last eight years midwives have attended about 72 per cent. of the confinements. During the year there was a troublesome outbreak of pemphigus neonatorum in the practice of one midwife, which was attributed to infection from a small suppurating sore under the thumb-nail. The antenatal clinic (conducted by Dr. E. M. Brereton) completed its first calendar year. The expectant mothers attending numbered 43, of whom 16 were primiparæ; 32 came up during the first six months of pregnancy, the remainder during the seventh and eighth months.

During the year 113 mothers were recommended for dental treatment under the maternity and child welfare dental scheme, conducted by Mr. W. B. Grandison, and all took advantage of the treatment offered. The pre-school children enrolled under this scheme numbered 392. Mr. Grandison finds the regular and frequent application of ammoniacal solution of nitrate of silver and formalin by Howe's method to to be particularly efficacious as a preventive. Among these children there were 6509 sound temporary teeth, 950 decayed and saveable, and 106 decayed and unsaveable, and one sound permanent tooth. Forty samples of milk were examined for tubercle and three were found to be infected. The county medical officer's report showed that one sample came from a herd of 39 cows, two of which had tubercle of the udder, whilst two samples came from a herd of 20 cows, which also included two with tuberculous udders. This result does not speak well for the value of notification by the farmer.

Watford

Dr. W. J. Cox remarks that housing still remains a difficult problem and the question of demolition of unfit houses is becoming urgent owing to serious disrepair in some cases. No progress has been made during the past year with the demolition of the 200 houses in clearance areas indicated in the five-year programme. Some relief to the shortage has, however, been afforded by the completion during 1932 of 80 new houses on Eastbury-road, in addition to 18 others built there in connexion with the tenant-purchase scheme. There still remains a list of 700 families desiring municipal houses and it is only possible to deal with a few of the worst cases of overcrowding. The Herts County Council is the supervising authority for midwives and maternity and nursing homes, and has opened during the year a well-equipped maternity home (22 beds) for the use of Watford and the district. There are only two midwives in private practice, as most of the cases are attended from the county council training centre.

The water-carriage system is in general use except in Garston, where there are cesspools. Progress has been made in the extension of the main sewer to Garston.

The eight-bed small-pox hospital has been closed and arrangements made for the admission of small-pox cases to the county hospital at Cheshunt. The isolation hospital with 66 beds serves four neighbouring districts as well as the borough—a total population of over 100,000. The county council's scheme is to have five large isolation hospitals to accommodate 455 patients, and it is suggested that the Watford joint hospital should be extended and form one of these.

Kilmarnock

Dr. B. R. Nisbet says that the statistics for the year are on the whole very satisfactory. The death-rate is lower than for the past two years. The infant mortality-rate shows a drop of 20 over the previous year, but this drop is almost entirely accounted for by the decline in the neonatal rate from 35·7 to 17·3. The maternal mortality figure in 1930 was 12·3, and the 23 deaths from tuberculosis compare with 40 in the previous year.

School medical inspections within the burgh are to be carried out by the public health staff and an assistant medical officer has been appointed. Information with regard to the incidence of non-notifiable infectious diseases will be more complete in future now that the same nurses do infant welfare, school, and tuberculosis work. The nurses pay more frequent visits to open cases of tuberculosis, and Dr. Nisbet notes that the nurses have instructions to insist on separate eating and drinking utensils for infectious cases.

Several matters have been the subject of inquiry during the year. It was alleged that the pneumonia death-rate was excessive among the inhabitants of Townholm Huts. Two other districts were chosen as controls and it was found that during the four years 1928–31 the pneumonia death-rate in Townholm Huts was six times as great as for the town generally and four times as great as in either of the control districts. The only marked difference between this hutment scheme and hutment schemes in other localities, says Dr. Nisbet, is that the road and approaches at Townholm are abnormally bad. "Mud abounds everywhere during the greater part of the year." Before this inquiry there was a widespread feeling that the huts had outserved their usefulness.

Another inquiry was made into allegations that there had been an increased incidence of intestinal complaints since a change was made in the filtration of the water-supply in 1924. A comparison of the four years before the filtratior was altered and the four subsequent years, which included the burgh death-rates and the proportion of intestinal cases

under treatment at Kilmarnock Infirmary, produced no evidence that the change in the water-supply had had any detrimental effect on health.

A third inquiry dealt with the supposed greater incidence of common air-borne infections in the population adjoining the two rivers (both of which are polluted) as compared with the population living at a distance from the rivers. The notification-rate was found to be 11·5 in the area adjoining the rivers as compared with 7·8 for the rest of the population. This difference was less marked than in 1930, but in the meantime a certain amount of improvement had taken place in the rivers.

Edmonton

Dr. H. W. Harding reports that the Queen's Nursing Association began a successful contributory scheme in the early part of 1931, and that at the end of the year three nurses were at work. Members pay 1*d.* a week or 1*s.* quarterly and are entitled to the provision of skilled nursing in their homes.

There were 127 notifications of diphtheria and five deaths. Of seven nasal swabs tested for virulence, three were virulent, one mildly virulent, and three avirulent. The isolation hospital was unable to cope with the outbreak of scarlet fever in the winter months. Notifications numbered 455. The type of the disease was serious, with frequent septic complications, and there were seven deaths. Influenza was very prevalent during the first three and the last two months of the year. During the earlier period there were 35 notifications of pneumonia and 21 deaths, and during the later period 42 notifications with 24 deaths. During the remainder of the year there were only 22 notifications of pneumonia.

Dr. Harding shows that after the first year children are only visited on the average once in ten months. He does not think, however, that more frequent home visiting would have the effect of materially reducing the number of defects found among school entrants. What is needed, he says, is the routine medical examination of the child during this age-period.

During the autumn months, owing to the expenditure greatly exceeding the estimate, restrictions were made in the scheme for supplying milk either free or at quarter cost. It was decided to grant milk only to mothers attending the welfare centres and that all recipients should pay one-quarter of the cost. Only one mother availed herself of the home-help scheme, started in 1930, in spite of the fact that the charge to mothers has been reduced from 1*s.* to 6*d.* per hour. The number of foster-parents on the register for the Children Act has risen from 71 to 85 and the number of children has fallen from 43 to 40. During the year five boys and four girls were adopted under the Adoption Act of 1926.

MENTAL HOSPITAL REPORTS

The 105th annual report of the JAMES MURRAY'S ROYAL ASYLUM, PERTH, shows a record high number of admissions during the year 1931–32. The number under treatment during the year—viz., 272—constitutes another record. On March 31st, 1932, there were 184 patients under care. Of the 91 admitted, 53 came on a voluntary basis and 38 were certified. Of the 62 patients discharged during the year, 35 had recovered. The death-rate was 14·2 per cent., and post-mortem examinations were made in 11 of the 26 fatal cases. There was an epidemic of broncho-pneumonic influenza in March, and this was responsible for the high death-rate. The Gilgal hospital has now been operating for a year, and has received 58 patients. It is more than a "reception block"; it is designed for the convalescent and the "nervous breakdown" type of case. A high standard of general behaviour and social and conventional conduct is expected from the inmates. It is essentially a hospital, and is equipped with verandahs, baths, and electricity. The directors of the Perth Royal Infirmary have now established an out-patient clinic which has proved of value in clearing up some obscure and difficult cases, and making arrangements for others. During the year two attendants and four nurses passed the final examination of the General Nursing Council for Scotland, and the deputy matron passed the final Royal Medico-Psychological Association examination with distinction, and one attendant also obtained this certificate.

There were 1234 patients at the MONMOUTHSHIRE MENTAL HOSPITAL, at ABERGAVENNY, on Dec. 31st, 1931. The recovery-rate for the year was 24·7 per cent., a figure which is rather below the average on account of the unfavourable type of the admissions, and the death-rate was 7·9 per cent. There was a good deal of infectious disease: three cases of typhoid fever, a widespread epidemic of influenza, four cases of chicken-pox, and 16 cases of scarlet fever. The out-patient clinic at the Royal Gwent Hospital, Newport, has been held fortnightly, and 97 new cases have been seen. Several cases from the clinic have been admitted to the hospital as voluntary boarders. Increasing use is being made of the laboratory, with valuable results. Continuous baths are used for suitable cases, and the verandahs are occupied all the year round. Three cases of general paralysis have been treated by induced malaria. Patients are encouraged to employ themselves, and the committee is considering the engagement of an occupation officer. The dental surgeon visited weekly and extracted 199 teeth. The floods in May did much damage to hospital property, but this has now all been made good. The extension of the nurses' home has been completed, and the new house for the assistant medical officer is now occupied. Parole is granted to 65 men beyond the estate, and to 90 within it, and 27 women have a large amount of freedom within the grounds. The hospital has unfortunately to house a large number of low-grade imbeciles, who would be much better accommodated elsewhere.

The COUNTY AND CITY OF WORCESTER MENTAL HOSPITAL, POWICK, had 1064 patients in residence on Dec. 31st, 1931. No voluntary or temporary patients were admitted. The recovery-rate was 56·1 per cent., and the death-rate 6·1 per cent. Post-mortem examinations were made in 60 per cent. of the deaths. The general health was good, except for a mild epidemic of influenza. The dentist visited fortnightly and investigated every newly admitted case. The out-patient clinic held weekly at the Worcester General Infirmary was attended by 27 patients. Two additional verandahs were build during the year. Satisfactory terms for the supply of an electrical current have been arranged with the Worcester corporation. Three patients suffering from general paralysis were treated by alternate courses of Colsul injections and intravenous arsenic. Three male and seven female nurses obtained their Royal Medico-Psychological Association certificate, one of the latter with distinction.

The GLASGOW ROYAL MENTAL HOSPITAL publishes its 118th annual report for the year 1931. There were 545 patients in residence on Dec. 31st; of the 127 admissions, 79 were voluntary. It is gratifying to learn that the institution has obtained a charter allowing it to drop the name of "asylum." The recovery-rate was 35 per cent., and the death-rate 7·4 per cent. A careful study has been made of the malarial treatment of general paralysis; of 20 cases treated at Gartnavel, 10 have been discharged as recovered, and 4 have died. The hospital is to investigate the treatment of this condition by diathermy. The occupational therapy department publishes its own report, showing the valuable work that it is able to do for the patients. The dentist reports 245 attendances during the year. The holiday house at Skelmorlie has been occupied during the year. The East House kitchen is being converted into a small reception centre for females; it will provide eight single rooms, a ward of four beds, a day-room, and an X ray apparatus and electric treatment room. Ward II. in the West House has been turned into an admission unit for males. In March, 1931, Darleith House, Cardross, was opened as a nursing home for 20 patients who can afford private care.

OBITUARY

JAMES ALFRED PATRICK CULLEN, M.D. Lond.

WE regret to announce the death of Dr. James Alfred Patrick Cullen, which occurred at Mombasa, B.E.A., on June 18th, at the age of 56. He had not been in good health for three or four years, but the direct cause of his death was an attack of malaria.

Patrick Cullen was born in India, the son of James and Elizabeth Cullen. He was educated at Epsom College, and the medical school of the London Hospital, and after qualification in 1899 served as house surgeon and assistant anæsthetist at the hospital. He then became house surgeon at the Seamen's Hospital, and the connexion with the London School of Tropical Medicine eventually influenced his career. At first he bent towards the public health branch of medicine. He took the D.P.H. in 1908 and the M.D.Lond. in 1911; he was Jenks Memorial Scholar of the Royal College of Physicians; and was in succession M.O.H. of Poplar and the county borough of Brighouse, Yorks.

DR. CULLEN
[Photograph by Elliott & Fry.

After the war Cullen acquired a "wander-lust," and took appointments abroad successively in many countries—N. America (Mexico), India (Burmah), Africa, Australia, and again in Africa. He did excellent work in all, and particularly at Namtu in Upper Burmah. When working as principal medical officer of the Burmah Corporation at Namtu, Upper Burmah, he discovered that *Schistosoma japonicum* was endemic in Burmah. He found that it was spreading from China over the China-Indo border. The importance of this work lay in the fact that the infected Yunnan province lies adjacent to Burmah, and the streams of Chinese labour passing over the boundary into India constituted a real danger to the latter countries, as it was almost certain that the intermediate host was present in Burmah. But the cases he had reported had never been over the China-Indo border and had lived all their lives in Namtu and district, so that Cullen's discovery was a piece of work of practical value, and it was carefully done and conclusive. It was reported in the Proceedings of the Royal Society of Medicine in July, 1929, while, under the title "Human Schistosomiasis in India," a further account will be found in the *Journal of Tropical Medicine and Hygiene* for December of the same year.

Cullen's inclinations were towards research, and he probably would have made a far greater mark in the profession had he been able to secure appointments giving him a larger outlook.

A personal friend writes of him: "Cullen was a man of great professional ability, a good correspondent, a loyal friend, and a pleasant companion. A capable, critical Irishman, he was fearless and uncompromising, with high ideals which guided his own life, while he looked for the same lofty ethical standard in others. His death is a loss to the profession, and he will be missed by many personal friends."

THE LATE DR. BEDFORD PIERCE

Mr. L. G. Brock, Chairman of the Board of Control, has sent us the following:—

"By the death of Dr. Bedford Pierce psychiatry loses a distinguished figure and the Board of Control lose an old friend, who had endeared himself to all his colleagues, and indeed to all with whom he came in contact as a Commissioner. A man of commanding presence, with a fine face lit up by kindly humorous eyes, there was little at first sight about him to suggest the Quaker or the physician. Indeed, there was something soldierly about his tall figure, though he was in reality a born doctor and a Quaker of the finest type. No one could meet Bedford Pierce even casually without being conscious of his shining integrity and high ideals. Yet no man was ever less of a prig or a preacher. His standard in medicine and in life was of the highest, but his keen sense of humour and his zest for life saved him from austerity. He enjoyed life; he was happy in his work, he loved his garden, and without being an expert naturalist he was a keen observer of bird life, as he showed in a charming letter a few months back in the *Times*, which was written in the course of a long and wearying illness. But first and last he was a physician whose interest in medicine remained keen to the end and was never at any time limited to the specialty which he practised with such distinction. As the superintendent of The Retreat at York he worthily carried on the tradition of Tuke, and in 1919–20 he proved an admirable president of the Royal Medico-Psychological Association. A man of sound judgment and much learning he was always ready to help those—and they were many—who sought his counsel and advice.

"Bedford Pierce never allowed his mind to rust, and when in 1929 I sounded him as to his willingness to accept a temporary Commissionship at the Board he accepted with alacrity the chance of returning to more active work. Before definitely accepting he sought medical advice and was told that he was perfectly fit. Unfortunately he had over-estimated his strength, and I am afraid that there can be no doubt that the enthusiasm with which he threw himself into his new duties shortened his life. The work of visitation was physically too exhausting, and to his great regret after two years he was compelled to resign. But I do not think he would have had it otherwise; he would have preferred to burn out than to rust out. By his death we have lost a genial kindly colleague, a great Christian gentleman, and a true physician. Sit tibi terra levis."

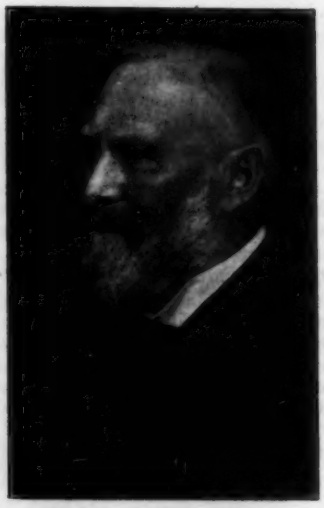
FRANCIS GEORGE PENROSE, M.D., F.R.C.P. Lond.

LATE PHYSICIAN TO ST. GEORGE'S HOSPITAL

WE regret to announce the death of Dr. Francis Penrose, late physician to St. George's Hospital and consulting physician to the Children's Hospital, Great Ormond-street, which occurred at Lynton on July 16th, at the age of 75.

Francis George Penrose was the only son of Francis Cranmer Penrose the famous architect, astronomer, and antiquary, who was the original

"Mary" to whom his mother, under the pseudonym of "Mrs. Markham," addressed the famous History of England "for young persons." Francis Penrose was educated at Repton, proceeding for his medical studies to University College Hospital. He took the M.R.C.S. in 1884 and graduated as M.B. in the same year, and held the house appointments at the hospital. Later he was demonstrator of physiology in the school, and in 1886, having taken the M.D. degree, he was appointed registrar to Great Ormond-street Children's Hospital, in connexion with which institution he did his best known work. He became assistant physician in 1891, and in 1894 full physician, being appointed consultant on his retirement from the staff in 1905. He took the M.R.C.P. Lond. in 1887, and in the following year his work at Great Ormond-street secured him the appointment of assistant physician and curator of the museum to St. George's Hospital, where a succession of vacancies on the staff had occurred. He was elected F.R.C.P. in 1895, and in due course became full physician to the hospital. He was assiduous in the discharge of his duties, and a clear lecturer on clinical medicine and materia medica, while he made a close study of dermatological cases. He wrote little, but published accounts of interesting cases occasionally in the transactions of of some of the medical societies. He acted for a period as examiner in materia medica at the English Conjoint Board.



DR. PENROSE

In 1904 Penrose retired from practice, resigned his appointments, and went to live in Bournemouth where he pursued his marked bent for natural history, especially ornithology, and acted as president of the Bournemouth Natural Science Society. He married in 1894 Helen, daughter of Mr. Laundy Walters, by whom he had two daughters.

Sir Thomas Barlow sends the following appreciative note of his old pupil and friend :—

"I knew him well as a devoted and enthusiastic student, and throughout his subsequent career as a man of high personal character. He came of a very cultured stock; his father was a classical scholar, and a great authority on the orientation of Greek temples. His sister was for a time principal of Somerville College, Oxford. But Penrose's sympathies were with natural history; he was a good ornithologist. After he had held the resident posts of house surgeon and house physician he became medical registrar at the Children's Hospital, Great Ormond-street, and after a few years he was appointed assistant physician. He knew his medicine and his morbid anatomy, and he was a good histologist. He worked out for me very thoroughly the histology of a case of myelitis occurring in the exanthem stage of measles, and we subsequently published this. Penrose was afterwards appointed assistant physician to St. George's Hospital, and ultimately he became full physician and lecturer on medicine at the school.

"With such an excellent equipment he might fairly have expected a successful career as a London consultant, but family and health anxieties had to be faced, and at length these and other reasons led Penrose to give up practice and retire to the country. He had a happy life, and his interest in natural history gave him many delightful experiences."

Dr. G. F. Still writes :—"As one who worked under Penrose many years ago at the Hospital for Sick Children, Great Ormond-street, I should like to add a tribute to his sterling worth. Penrose had passed through the stages of medical registrar and of assistant physician before I first knew him. Later we became colleagues on the honorary staff, and by this time I had already learned to appreciate his kind and generous spirit. He was a man whom one could respect, for he hated sham and insincerity. His interests were perhaps more in country pursuits than in clinical medicine; he was a lover of birds and also a keen photographer, but his house physicians recognised his clinical acumen, and would acknowledge that their time with him was well spent. I remember, when I was at that stage, putting an exploring needle into a child's chest and withdrawing a very small quantity of clear fluid, which to my inexperienced eye was nothing more than unusually clear pleural effusion, but Penrose detected its significance at once, and the microscope proved him right, for the fluid contained hydatid hooklets. His love of the country led him to retire earlier than most physicians do, and when last I met him a few years ago he spoke as one thoroughly happy in his country life. Though he has passed away, Penrose will live long in the memory of those who knew him."

PARLIAMENT

NOTES ON CURRENT TOPICS

National Economy and Public Health

ON the motion for the second reading of the Appropriation Bill in the House of Commons on July 11th,

Mr. DAGGAR referred to a statement of the medical officer of health for the Abertillery Urban District, which pointed out that a number of boys and girls attended school with footgear which was in a very bad state of repair. There was a considerable falling off in the condition of their underclothing.

Mr. E. WILLIAMS said that the children in the Bridgend county schools had for years been housed in old army huts where they froze in winter and roasted in summer. In those huts, covered with corrugated sheeting, children had to be taught in accordance with the secondary curriculum. It was an absurdity to talk about economising on secondary education at the expense of the children in this way.

Major ELLIOT (Financial Secretary to the Treasury), replying to the debate, said that Mr. Daggar had contended that his people were deteriorating in health. For four years he had closely studied the health conditions in Scotland during a terrible period of unemployment. The report of the Scottish Board of Health, giving the average height and weight of the children of 5, 9, and 13 years for 1907, 1924, and 1931, showed that the height and weight of 9 and 13 years old children living in one-apartment houses in 1931 surpassed those of the children from two- and three-apartment houses in 1907. If the accusation were true that the recent economies had injured the standard of living of the

people and that the cuts imposed by the Government had sensibly impaired public health it was a very grave one indeed. But the 1922 unemployment benefit for a man, wife, and two children was 22s., and in that year it could buy, calculated in terms of wheat, 250 lb. of wheat for one week. In 1932 the benefit for the same sized family had more than doubled in terms of that one commodity, and the relief given would purchase 500 lb. of wheat for the week. That fact indicated in a flash the great fall in the price of staple foods which had taken place. That was why the effect of decreased unemployment benefit and other things had not been so serious as had been feared.

Summer Adjournment

Both Houses of Parliament adjourned on Wednesday, July 13th, for the summer recess. They will reassemble on Oct. 27th, unless called together earlier to deal with emergency business.

The Royal Assent was given to a number of Acts, including the National Insurance and Contributory Pensions Act. On the previous day the Royal Assent was given to the Town and Country Planning Act, the Patents and Designs Act, and the Extradition Act.

HOUSE OF COMMONS

TUESDAY, JULY 12TH

Institutional Treatment of Tuberculosis

Mr. CONANT asked the Minister of Health what percentage of the 44,517 persons admitted to residential institutions suffering from tuberculosis in 1930 were Group 2 or moderately advanced cases; and what percentage of Group 2 cases were discharged with their disease quiescent.—Sir E. HILTON YOUNG replied: The information asked for in the first part of the question is available only in respect of the persons who were discharged from or who died in these institutions during 1930. The number of such persons was 36,722, and of these, 12,147, or 33 per cent., were classed in Group 2 at the date of admission. 802 of these patients, or 6·6 per cent., were discharged with their disease quiescent. These figures relate to England and Wales.

WEDNESDAY, JULY 13TH

Causes of Road Accidents

Sir HENRY JACKSON asked the Minister of Transport whether he proposed to take any steps to obtain a more complete analysis of the causes of road accidents, in order that in the light of the information thus obtained more effective means might be devised for their prevention.—Mr. PYBUS replied: In consultation with the Home Office and with the Scottish Office, I propose to arrange for a special investigation of the causes of all fatal road accidents over a period sufficiently long to give reliable results. In the case of fatal accidents information is generally available in the form of police reports or of evidence before the coroner, which if properly collated would enable the cause of the accident to be established with some degree of certainty. The information thus obtained will be set out in the form of a return, which has been in preparation for some time, suitable for mechanical tabulation. In this inquiry I propose to act in coöperation with the National Safety First Association, who have done valuable work in this field in the past.

Sewerage and Water Works Loans

Mr. SMEDLEY CROOKE asked the Minister of Health the number of loans of £50,000 and under sanctioned by the Ministry for sewerage and water works in England and Wales during the six months ended June 30th, 1931, and the six months ended June 30th, 1932, respectively, also the aggregate amount of such loans respectively; and whether these loans were sanctioned on the ground that the works were necessary in the interests of the public health and well-being.—Sir E. HILTON YOUNG replied: The figures are: for the first six months referred to, 959 loans for a total sum of £4,450,000; for the second six months, 645 and £2,460,000. The answer to the latter part of the question is in the affirmative. Many of the schemes were carried out with the aid of an unemployment grant.

Mr. SMEDLEY CROOKE asked if the right hon. gentleman did not agree that it was false economy to withhold sanction to these loans if in doing so it jeopardised the health of the people.

Sir E. HILTON YOUNG said that that was an obvious proposition.

Mr. MICHAEL BEAUMONT asked if the right hon. gentleman realised that it was by no means always the case that withholding sanction to such schemes endangered public health.

Sir E. HILTON YOUNG: That is also perfectly true.

Importation of Inedible Grease

Mr. ROSBOTHAM asked the Minister of Health if he had considered the copies sent to him of the correspondence between the American secretary of State and the minister for foreign affairs in the Netherlands regarding the renovating of inedible white grease for export to other countries for human consumption; and if, in the interests of the public health, he would take steps to prevent this product landing in this country.—Sir E. HILTON YOUNG replied: I am obliged to my hon. friend for sending me the correspondence and I will make inquiries. I should like to inform the House, however, that all lard imported into this country from the Netherlands bears a Government certificate, and it is derived from animals which were free from disease at the time of slaughter, and that before the certificate was recognised a specific assurance was given which would preclude its application to any product prepared from inedible grease.

Physical Training Centres for the Unemployed

Mr. TINKER asked the Minister of Labour where the centres would be to carry out the scheme for the physical exercises of young unemployed men; and how the instructors would be selected.—Mr. R. S. HUDSON (Parliamentary Secretary to the Ministry of Labour) replied: A centre has already been opened at Pontypridd. The other centres which it is proposed to open will probably be situated in Liverpool, Middlesbrough, and Glasgow. As regards the selection of instructors, the Department has endeavoured to engage the best men available with suitable qualifications.

Replying to a further question by Mr. Tinker, Mr. Hudson said the appointments would be made by the local controllers. They would be servants of the Department, and they were trying to get the very best men they could find in the localities.

Dr. Eichholz's Report on Deafness

Mr. MORGAN asked the Minister of Health whether he had received the report of the inquiry conducted by Dr. Eichholz on the problem of the deaf; and whether he could expedite its publication so that it might be available for the teachers of the deaf.—Sir E. HILTON YOUNG replied: The answer to the first part of the question is in the affirmative. Steps are being taken to publish the report as soon as practicable.

HUMAN DISEASE IN ANIMALS

AT the summer meeting of the University of London Medical Graduates Society, held on July 14th in the Zoological Society's gardens, Col. A. E. Hamerton, M.R.C.S., pathologist to the society, gave a demonstration of human diseases occurring in animals. The pathological department of the Zoo makes over 1000 post-mortem examinations a year. Many of these reveal conditions with which the human pathologist is familiar, but certain groups of animals are immune from the commoner human diseases. For instance, most of the lower mammals, including monkeys, do not suffer from the common cold, to which the anthropoids fall easy victims, a collateral proof of their human affinities. Again, post-mortem appearances suggestive of one infection may be found in animals to be due to a different organism, as when repeated cases of dysentery failed to furnish a single Shiga's bacillus, although Morgan I. and paratyphoid could be identified. Some diseases, on the other hand, appear to be of almost universal occurrence. Of these the most striking example is tubercle, which infects all animals (with the possible exception of donkeys and mules) although in different strains. The incidence of tubercle among the monkeys at the Zoo has fallen since the introduction of sterilised tinned milk in place of fresh milk. Col. Hamerton mentioned the occurrence of rickets in burrowing and nocturnal animals. Hedgehogs always develop this disease in captivity, while it is unknown among wild hedgehogs, although neither are exposed to sunlight and their food is apparently identical. Cod-liver oil fails to cure the condition in these animals.

MEDICAL NEWS

University of London

At recent examinations the following candidates were successful :—

DIPLOMA IN PSYCHOLOGY

Stella C. Corderoy, Gladys M. James, Margaret Mackay, Patrick Slater, and M. E. T. Wilkinson.

D.P.H.

C. A. Bozman, C. J. H. Brink, C. G. H. Campbell, E. J. de Verteuil, Mary G. H. Dickson, A. R. Forbes, Agnes B. Francklyn, T. O. Garland, J. C. P. Grey, R. D. Gross, F. B. Khambatta, George Macdonald, H. A. Mackenzie-Wintle, R. B. Mayfield, R. M. Morris, L. E. J. Poulier, A. M. Samarasinghe, A. R. Thompson, K. C. Uppal, T. W. Ware, and H. B. Wilson.

Part I.—R. J. I. Bell, J. L. Burn, H. G. H. Butcher, L. P. Clarke, F. G. Macdonald, Turaga L. Narayana, and Doris G. Sharvelle.

University of Durham

On June 29th the following degrees and diplomas were conferred :—

M.D.—T. S. Blaiklock, T. L. J. Coxon, J. R. Hindmarsh, J. A. Hislop, C. F. Ind, T. F. Jarman, T. H. Kirk, R. A. Pallister, J. H. Pool, Alfred Swindale, and W. S. Walton.

M.D. for Practitioners of 15 years' standing.—C. L. Balkwill, L. Gill, J. L. Hamilton, D. B. S. Jones, H. G. Peel, G. S. Phillips, E. S. Rowbotham, L. H. Terry, and H. R. Tighe.

D.Hy.—G. C. M'Gonigle.

M.B., B.S.—J. P. Blaiklock, E. J. Blair, W. H. Bourn, E. G. Brewis, Constance R. Caris, John Clay, George Davison, D. G. French, W. M. Henderson, W. M. Jones, J. C. Livingston, H. A. Lockhart, G. I. Mackinlay, J. F. M. Milner, T. Moore, G. J. Murray, Dorothy D. Nichol, Helen Ramsay, R. W. Riddle, R. W. Scott, L. M. Snaith, T. A. Stevens, Edith J. Thompson, and R. T. Wordingham.

B. Hy.—William Alcock and H. H. D. Anderson.

B.D.S.—A. D. Hitchin.

D.P.H.—William Alcock, H. H. D. Anderson, and J. R. Hetherington.

L.D.S.—Cecil Handley and G. M. Sinclair.

University of Dublin

At recent examinations in the School of Physic, Trinity College, the following candidates were successful :—

M.D.

William Russell and E. Bethel Solomons.

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Medicine.—J. W. Craig, J. J. Russell, C. J. Hassett, W. J. Craig, Martin Fallon, Sydney Brass, C. de V. Shortt, C. H. M'Mahon, P. P. Murphy, Alfred Pollitt, J. L. du Preez, James Conroy, Henry Michael, G. C. V. O'Driscoll, C. J. Mullen, L. L. Nel, W. M. E. Anderson, G. F. Harris, Edith M. P. Brodrick, Francis King, P. W. O'Ryan, and Robert M'Neilly.

Surgery.—S. N. Varian, J. L. du Preez, J. G. Wilson, C. de V. Shortt, P. H. Stone, H. B. Wright, P. P. Murphy, A. J. Harden, Martin Fallon, Henry Michael, Sydney Brass, W. A. Ryan, James Conroy, I. G. M'Intyre, and G. F. Harris.

Midwifery.—J. S. M. Pringle, J. R. Counihan, Joseph Elliman, R. G. Taylor, E. A. Smyth, A. W. Callaghan, Henry Michael, H. S. Perrot, A. B. Warren-Darley, D. C. Evans, and James Conroy.

D.P.H.

Part I.—C. H. Adderley.

Part II.—G. W. H. Townsend, W. R. Johnston, H. M. Nevin, and W. J. E. Jessop.

DIPLOMA IN GYNÆCOLOGY AND OBSTETRICS

T. C. Dey.

DIPLOMA IN PSYCHOLOGICAL MEDICINE

Part I.—O. W. S. FitzGerald.

Queen's University of Belfast

The following degrees and diplomas were conferred on July 8th :—

M.D.—W. F. Lyle (with commendation), Olive M. Anderson, J. G. Craig, M. J. Gordon, and F. F. Kane.

M.B., B.Ch., B.A.O.—First Class Honours : W. S. Campbell.

Second Class Honours : E. A. J. Byrne, W. S. Empey, G. D. Flatley, B. M. Maxwell, W. A. Page, and D. H. Smyth.

Pass : H. J. Browne, Phoebe S. Burns, A. D. Campbell, Raymond Christie, H. L. Donnan, J. C. Entrican, R. E. W. Fisher, A. B. FitzSimons, W. S. L. Gilchrist, Lionel Gorfunkle, Hugh Graham, W. D. Hamilton, R. A. C. Herron, Eli Hodes, J. R. S. Innes, R. G. Kennedy, Eileen M. Kirkpatrick, R. F. Lavelle, F. J. Leddy, W. D. McCullagh, Hugh Milligan, W. G. Mitchell, Samuel Perry, J. A. Price, Joseph Reid, W. D. Swan, and J. A. Thompson.

D.P.H.—J. N. Atkinson, Margaret Bamber, Rachel A. Elliott, Kirk Forsythe, H. S. A. Henry, Martha E. Hutchinson, Margaret L. Irvine, C. F. Lynch, G. P. M'Cullagh, Nora Maybin, Jane Sutherland, Jean C. Watson, J. N. Whyte, and Mary C. Young.

D.P.M.—G. R. Wadsworth.

The Sinclair medal in surgery was awarded to W. G. A. Bingham, the Adami medal in pathology to W. C. M'C. Wilson, and the Symington medal in anatomy to N. S. Martin.

University of Cambridge

At recent examinations the following candidates were successful :—

D.M.R.E.

Part II.—Margaret A. Bromhall, A. C. Devaraj, Nathaniel Fram, E. D. G. Gillies, C. H. Hilliard, R. F. Innes, C. B. Jennings, S. D. Kilner, W. K. Morrison, S. A. Nagga, and A. B. Sullivan.

University of Manchester

Theses presented by the following candidates have been approved :—

M.D.

R. J. Batty, W. C. V. Brothwood, *N. S. Craig, *Margaret Egan, †Donal Sheehan, †Raymond Whitehead, and Charles Wilcocks.

* With commendation.
† Gold medal.

Royal College of Surgeons of England

A quarterly meeting of the Council was held on July 14th. Lord Moynihan, the president, announced the re-election to the Council of Mr. Wilfred Trotter, F.R.S., and the election of Mr. A. E. Webb-Johnson and Mr. G. Gordon-Taylor.

Sir Holburt Waring was elected president of the College, and Mr. W. Sampson Handley and Sir Percy Sargent were elected vice-presidents. Mr. R. H. Burne (physiological curator), Mr. C. F. Beadles (pathological curator), Miss M. L. Tildesley (curator of the department of human osteology), Sir Frank Colyer (honorary curator of the odontological collection), and Mr. C. J. S. Thompson (honorary curator of the historical collection) were re-elected. Mr. J. H. Thompson was appointed Bernhard Baron scholar, and Mr. Laurence O'Shaughnessy was reappointed College research scholar.

Membership of the College was granted to Eric Rudkin (Birm.). The Fellowship was granted to Israel Preiskel (Bart.'s) and Thomas King (Melbourne and Guy's).

Licences in dental surgery were granted to the following :—

I. M. Ayliffe, G. C. Bailey, V. P. Betts, R. W. Birkett, O. H. Bowen, R. W. D. Brownlie, R. S. Bruce, T. H. Chignell, H. B. Christian, M. B. Conlin, P. A. Crow, J. T. P. Cullingford, B. Davis, H. C. Dobbie, M. H. A. El-Mangoury, R. J. Eustace, T. L. Grayson, C. B. de V. Green, R. H. Hamlyn, H. N. V. Hathorn, A. G. Heydon, M. G. Huggins, H. G. Jokelson, C. G. Lingford, F. J. Mardon, D. C. D. Mathews, Ernest Matthews, R. E. Morgan, W. F. Newman, G. F. Power, R. W. Ross, Nasif Salama, M. M. Samy, Gladys C. R. Sarson, J. S. Schofield, C. W. T. Shuttleworth, W. H. Silverstone, G. A. H. Wells, A. W. J. West, I. D. C. Williams, Sydney Williams, A. J. S. Wilson, J. P. Wilson, Joan M. Wilson, G. M. Woolford, and G. R. Wootton.

Diplomas in public health, tropical medicine and hygiene, psychological medicine, and laryngology and otology were granted jointly with the Royal College of Physicians.

The Hallett prize for anatomy and physiology was awarded to Mr. J. S. MacMahon, of Middlesex Hospital, and the third Macloghlin scholarship for medical students to Mr. Herbert Alstead, of Wigan Grammar School.

The following professors, lecturers, and demonstrators were appointed for the ensuing year :—

Hunterian Professors.—Sir Arthur Keith, six lectures on some anatomical subject; Mr. K. M. Walker, one lecture on Perurethral Operations on the Prostate; Mr. P. H. Mitchiner, one lecture on an Epitome of the Tannic Acid Treatment of Burns and Scalds; Mr. J. Paterson Ross, one lecture on Sympathectomy as an experiment in Human Physiology; Mr. H. P. Winsbury-White, one lecture on the paths of infection between the Genital and Reproductive Organs and the Urinary Tract; Mr. Stanford Cade, one lecture on Radiation Treatment of Buccal and Pharyngeal Cancer; and Mr. H. Jackson Burrows, one lecture on Tissue Culture in its relationship to Surgical Pathology.

Arris and Gale Lecturers.—Mr. P. N. B. Odgers, one lecture on the Lumbar and Lumbo-sacral Diarthroidal Joints; Prof. R. J. S. McDowall, one lecture on the Physiology of Experimental Shock, with special reference to Anæsthesia; and Mr. R. W. Raven, one lecture on Diverticula of the Pharynx and Œsophagus, with special reference to the Morphological and Embryological aspects.

Erasmus Wilson Demonstrators.—Mr. C. E. Shattock, Mr. C. P. G. Wakeley, and Mr. R. Davies-Colley.

Arnott Demonstrator.—Sir Arthur Keith.

The Buckston Browne annual dinner of Fellows and Members will be held on Thursday, Nov. 10th, 1932, and the Lister memorial lecture will be delivered by Sir Charles Ballance on Wednesday, April 5th, 1933.

Royal College of Surgeons of Edinburgh

The following have been granted the diploma of L.D.S. :—

W. S. Short, C. D. Campbell, R. H. Hunt, N. McV. Heron, A. N. Terry, E. T. J. Dykes, T. H. Seath, J. C. Patterson, Han-shing Wan, Erwin Miller, and Alexander Forrester.

Medical Society of London

Delegates and members attending the British Medical Association centenary meeting will have an opportunity of seeing some rare books belonging to this society, which will be exhibited at 11, Chandos-street, Cavendish-square, W. 1, on July 25th to 27th, between 2 to 4 P.M.

University of Durham

College of Medicine.—Dr. Ernest McMurchie Dunlop has been elected professor of bacteriology in the University of Durham College of Medicine. Dr. Dunlop is at present lecturer in bacteriology in the University of Glasgow and clinical pathologist at the Western Infirmary.

University of Aberdeen

Regius Chair of Surgery.—The University court has decided that in future the professor of surgery shall devote the greater part of his time to the duties of the chair, and that his private practice will—with rare exceptions—be limited to cases seen and treated in the city. It is understood that preference will be given to those candidates of wide experience of clinical surgery and acknowledged power of teaching who, by their special training and record, have given evidence of their capacity for and interest in research. The holder of the chair is an honorary surgeon to the Aberdeen Royal Infirmary, with charge of beds, and an honorary consultant in the municipal hospitals. The appointment is made by the Crown on the recommendation of the Secretary of State for Scotland.

Medical Society of Individual Psychology

The annual general meeting of this society was held at the Florence Restaurant, London, on July 14th. Dr. W. Langdon Brown was re-elected chairman, and Dr. O. H. Woodcock vice-chairman for the ensuing session, with Dr. H. C. Squires as treasurer, Dr. F. G. Crookshank as secretary and editor, and Drs. M. Edwards, M. Marcus, J. Young, and Hilda Weber (assistant editor) as members of the committee. The opening meeting of the next session will be held on Oct. 13th, when Dr. Adler has consented to deliver an address. It is hoped that Dr. Adler, during his visit to England, will deliver addresses in Birmingham, York, and other centres, as well as in London. Communications relating to these or other meetings should be made to Dr. Crookshank, at 57A, Wimpole-street, W.1.

Large Bequests for Medical Research

Under the will of the late Mr. James Maxwell Grant Prophit, about £120,000 will become available for research on cancer and tuberculosis. The Royal College of Physicians of London will have charge of £15,000 for work on tuberculosis, and the Westminster Hospital £5000 for the same purpose. The Royal College of Surgeons of England will receive £10,000 and the Radium Institute £5000 for cancer research. Two scholarships for tuberculosis and two scholarships for cancer investigation are also to be founded, and will be awarded on the recommendation of the colleges.

British Homœopathic Congress

In connexion with this congress Sir John Weir will give a lecture on Homœopathy, an Explanation of its Principles, at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., at 5.45 P.M. on Tuesday, July 26th. This lecture is open to members of the medical profession. It has been arranged that the following hospitals shall be open for inspection and demonstration of cases at the times indicated. *Bromley:* The Phillips Memorial Hospital, Lownds-avenue, Bromley, Tuesday, August 2nd, from 3 P.M. *Liverpool:* The Hahnemann Hospital, Hope-street, Liverpool, Thursday, August 4th, from 10 A.M. and from 2 P.M. *Bristol:* The Bristol Homœopathic Hospital, Cotham Hill, Bristol, Saturday, July 30th, from 2.30 P.M. *Glasgow:* The Glasgow Homœopathic Hospital, Great Western-road, Glasgow, Tuesday, Wednesday, and Thursday, August 2nd, 3rd, and 4th, from 10 A.M. till 12.30 P.M.; the Scottish Homœopathic Hospital for Children, Mount Vernon, Glasgow, Tuesday, Wednesday, and Thursday, August 2nd, 3rd, and 4th, from 2 P.M. *London:* The London Homœopathic Hospital, Great Ormond-street, Queen-square, W.C. 1, Friday, July 29th, from 2.30 P.M. Medical men and women are invited to attend at these times. The address of the hon. secretary of the congress is 17, Devonshire-street, London, W. 1.

Central London Throat, Nose, and Ear Hospital

On Thursday, July 28th, at 3 P.M., in connexion with the British Medical Association's centenary meeting, there will be an exhibition of cases at this hospital, and also demonstrations of methods of diagnosis and treatment by members of the staff. Notes of the cases to be shown have been issued in book form. The hospital is in Gray's Inn-road, W.C.

Osler Club

The fifth Oslerian oration, entitled Book Production in the 18th Century, was delivered on July 12th by Dr. R. W. Chapman, president of the Oxford Bibliographical Society. Dr. A. P. Cawadias was in the chair, and Sir D'Arcy Power, Dr. Robert Hutchison, Mr. H. L. Jackson, Mr. J. G. Wilson, and others took part in the discussion.

An Oto-laryngological Exhibition

On Wednesday, July 27th, at 2.30 P.M., at the Royal College of Surgeons of England, Lincoln's Inn Fields, the Toynbee, Cheatle, Onodi, and Laryngological collections will be on view. A short introductory address will be given by Sir Arthur Keith, followed by demonstrations of specimens by Mr. T. B. Layton and Mr. Negus. These arrangements have been made in connexion with the Section of Oto-laryngology of the British Medical Association.

Expenditure by Local Authorities

The Committee on Local Expenditure at their first meeting appointed Sir William Ray, M.P., to be chairman, and Sir Percy Jackson to be vice-chairman. Subcommittees were set up on education, housing, public health, public assistance, roads, and agriculture. Communications to the committee should be addressed to the Ministry of Health, Whitehall, London, S.W. 1.

Colchester County Hospital Nurses' Home

Brigadier-General R. Beale Colvin, Lord-Lieutenant of Essex, last week opened an extension of the nurses' home at this hospital. In addition to the domestic accommodation the enlargements include a training school with lecture room and library and a cookery demonstration room.

An Employees Bed at Derby

A bed in the Derbyshire Royal Infirmary has been endowed by the work-people of Ley's Malleable Castings Co. and the Ewart Chainbelt Co. The cost has been partly provided by voluntary deductions from bonuses payable under a profit-sharing scheme.

Janus Stolp Prize

The governors of the Janus Stolp foundation (Legatum Stolpianum) in the University of Leiden, at their meeting on May 25th, decided on the following subject for their biennial scientific competition: An Original Contribution on the Psychology of the Knowledge of Space in the Blind.

Suggestions.—Experiments made in the course of observations among the blind have been of some importance in the solution of the problem of their knowledge of space, thanks, especially, to the analyses of observations made on persons born blind (e.g., refer to the work of M. von Senden, "Raum und Gestaltauffassung bei operierten Blindgeborenen vor und nach der Operation." Leipzig, 1932). Analogous observations should be capable of being subjected to scientific criticism. The education of blind persons directed to increasing their power of orienting themselves in space, to enable them to construct objects or to do manual work, to orient themselves in the street or in the house, and, more especially, to give them an idea of geometry (sensu strictiori). (Refer to a paper by Th. Heller, "Studien zur Blindenpsychologie," Leipzig, 1904.)

Interesting conclusions might be drawn from an analysis of the practical work of blind surveyors, perhaps, also, by observation of blind workmen. A study of the dreams of people born blind might even throw some light on the subject of the competition.

It is desired that competitors should choose only a part of the subject, but of sufficient extent to enable them to make a general résumé and a critical review. Entirely theoretical disquisitions, as well as observations embracing too many diverse points, are not desirable. The manuscript must not exceed 40,000 words, and should be sent to Prof. W. B. Kristensen, 31, Witte Singel, Leiden, before Jan. 1st, 1934. It must be typewritten in Dutch, German, English, French, or Latin, and signed with a motto and accompanied by a sealed letter with the same motto, enclosing the name and address of the author. The winning competitor will receive a gold medal of the value of 250 florins and 250 florins in money, or, if he should prefer it, the whole sum in money.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 25th to SATURDAY, July 30th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square. Lecture on Migraine by Colonel R. H. Elliot at 5 P.M. on Thurs.

Appointments

ANDERSON, A., M.D., Ch.B. Glasg., D.P.H., has been appointed Medical Officer of Health, Chorley.

BLIGH, J. M., M.D. Liverp., F.R.C.P. Lond., Honorary Physician to the Royal Liverpool Children's Hospital.

LAWSON, W. A. D., M.D., Ch.B. Leeds, D.P.H., Medical Officer of Health for Hastings.

MORRIS, L., M.D. Manch., F.R.C.S. Eng., Honorary Orthopædic Surgeon, Royal Infirmary, Leicester.

ORR, J. W., M.D., D.P.H. Belf., Lecturer in Experimental Pathology and Assistant Director of Cancer Research, University of Leeds.

Certifying Surgeons under the Factory and Workshop Acts: ANDERSON, C. W. N., L.R.C.P. & S.I. (Talybont, Cardigan); LAIRD, W. J. A., L.R.C.P. & S.I. (Lenham, Kent).

Vacancies

For further information refer to the advertisement columns.

Alton, Hants, Lord Mayor Treloar Cripples' Hospital.—Asst. Res. M.O. £150.

Bedford County Hospital.—Second H.S. At rate of £140.

Birmingham University.—Asst. Lecturer in Anatomy. £300.

Bradford Royal Infirmary.—Two H.S.'s. Each at rate of £135.

Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. to Dermatological Dept. Also Cas. H.S. £120.

Brisbane, Australia, Brisbane Clinic.—Surgeon for Ear, Nose and Throat. £500.

Burnley, Victoria Hospital.—H.S. At rate of £150.

Bury Infirmary, Lancs.—H.S. Also Third H.S. At rate of £175 and £150 respectively.

Calcutta School of Tropical Medicine.—Professor of Pathology and Bacteriology. Rs.850 a month.

Cardiff, King Edward VII Welsh National Memorial Association. Third Asst. Res. M.O. for Glan Ely Hospital, Fairwater. £250.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Assts. in the Out-patient Dept.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Cobham, Surrey.—Res. Surg. O. At rate of £200.

Coventry and Warwickshire Hospital.—H.S. for Aural and Ophthalmic Depts. Also Cas. H.S. Each at rate of £125.

Doncaster Royal Infirmary.—Cas. H.S. At rate of £175.

Dublin, Dr. Steeven's Hospital.—Asst. Res. Surg.

Dudley, Guest Hospital.—H.S. Also Asst. H.S. £200 and £170 respectively.

Evelina Hospital for Sick Children, Southwark, S.E.—Hon. Physician to Out-patients.

Gloucester, Gloucestershire Royal Infirmary.—Second H.S. At rate of £120.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hospital for Sick Children, Great Ormond-street, W.C.—Hon. Med. and Surg. Clin. Asstş. for Out-patients' Dept.

Hull Royal Infirmary.—Third H.S. Also Asst. H.P. Each at rate of £150.

Ilford, King George Hospital.—H.S. At rate of £100.

Inverness, Royal Northern Infirmary.—H.P. At rate of £100.

Jerusalem, St. John Ophthalmic Hospital.—Res. H.S. £400.

Lincoln, Bracebridge Mental Hospital.—Third Asst. M.O. £350.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool and Samaritan Hospital for Women, Catherine-street.—H.S. £100.

Macclesfield General Infirmary.—Sen. H.S. At rate of £180.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Margate and District General Hospital.—Res. M.O. £150.

Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.—Asst. Research Officer. £500.

Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. M.O. £350.

Nottingham Hospital for Women.—H.S. At rate of £150.

Oldham Royal Infirmary.—H.S. At rate of £175.

Plymouth, South Devon and East Cornwall Hospital.—H.S. At rate of £100.

Poplar Hospital for Accidents.—Hon. Radiologist.

Preston, Lancs, Wrightington Hospital, Parbold.—Jun. Asst. M.O. £200.

Princess Beatrice Hospital, Earl's Court, S.W.—Hon. Clin. Asst.

Rotherham Hospital.—Cas. H.S. £150.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Asst. P.

St. Charles Hospital, St. Charles-square, Ladbroke-grove, W.—Res. Asst. M.O. At rate of £250.

St. John's Hospital, Lewisham.—Res. M.O. £200.

Salford Royal Hospital.—Cas. H.S. At rate of £125.

Sheffield Children's Hospital.—H.S. At rate of £100.

Sheffield, Jessop Hospital for Women.—H.S. At rate of £100.

Sheffield Royal Infirmary.—Aural H.S. and Asst. Aural and Ophthalmic H.S. Each at rate of £80.

South-Eastern Hospital for Children, Sydenham, S.E.—Res. M.O. At rate of £120.

South Shields, Ingham Infirmary.—Jun. H.S. £150.

Swindon and North Wilts Victoria Hospital.—Res. M.O. £125.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Ventnor, Royal National Hospital for Consumption and Diseases of the Chest.—Jun. Asst. Res. M.O. At rate of £300.

Walsall General Hospital.—H.S. At rate of £150.

Wolverhampton Royal Hospital.—H.P. Also H.S. At rate of £125 and £100 respectively.

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On July 13th, the wife of J. S. Anderson, M.D., Seacroft Hospital, Leeds (Mary Stirk, M.R.C.S., L.R.C.P.), of a daughter.

BUIST.—On July 11th, at Karachi, the wife of Major T. P. Buist, R.A.M.C., of a son.

CRAIG.—On the 13th inst., 1932, to Dr. and Mrs. D. Duncan Craig, of 10, Oakley-street, Chelsea, S.W.3—a son.

VANCE.—On July 12th, at Greenoge, Clonskeagh, Dublin, the wife of Major R. L. Vance, I.M.S., of a son.

DEATHS

CUNNINGHAM.—On July 13th, at St. Thomas's Hospital, John Francis Cunningham, O.B.E., F.R.C.S., of Weymouth-street, aged 56.

HAMILL.—On July 7th, at Llanelly, Robert James Hamill, M.A., M.D.

KIDD.—On July 15th, at Howley-place, W., James Dunlop Kidd, O.B.E., M.C., M.B., Lieut.-Colonel, R.A.M.C. (retired), aged 49.

OTWAY.—On Monday, July 18th, suddenly, Alfred Carrol Otway, M.R.C.S., L.R.C.P., aged 74, of 63, Castelnau, Barnes, S.W. Cremation at West Norwood, Friday, at 12.30. Service at Barnes Parish Church, 11.30.

PENROSE.—On July 16th, at Lynton, Devon, Francis George Penrose, M.D., F.R.C.P., of "Woodbury," East Cliff, Bournemouth, aged 75.

WALKER.—On July 13th, at Burwash, Walter W. Walker, M.B., B.Chir. Camb.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE MEDICAL DIRECTORY

Messrs. J. and A. CHURCHILL (40, Gloucester-place, London, W.1), write: "To maintain the accuracy of our annual volume we rely upon the return of our schedule which has been posted to each member of the medical profession. Should the schedule have been lost or mislaid, we will gladly forward a duplicate upon request. The full names of the doctor should be sent for identification."

THE MARMITE FOOD EXTRACT COMPANY informs us that Vegex, the yeast extract used by Dr. M. B. Strauss and Dr. W. B. Castle for the purpose of providing Vitamin B_2 (see THE LANCET, July 16th, p. 112), is the name under which Marmite is retailed in the United States. It is manufactured in this country and supplied through American agents.

NOTES, COMMENTS, AND ABSTRACTS

RADIUM AS A PHARMACEUTICAL POISON

BY H. A. COLWELL, M.B., PH.D., M.R.C.P., D.P.H.
AND
SIDNEY RUSS, C.B.E., D.Sc., F.INST.P.

(From the Barnato Joel Laboratories of the Middlesex Hospital, London)

IN this country but little has yet been heard of the effects of radium as a poison, but in the United States poisoning by radio-active substances has been made the subject of at least two official publications by the public health authorities.[1]

We propose to refer mainly to the employment of radio-active substances by unqualified practitioners and laymen, but first we review the legitimate use of these substances, dealing, secondly, with some of the deleterious effects produced by their industrial use and internal administration under untrained directions.

Radio-active Mineral Waters

For hundreds of years, and in some cases longer, certain naturally occurring mineral waters have enjoyed a deserved reputation for their curative properties in medical treatment. This has led to the formation of spas or health resorts where the beneficial results of the local springs can be had to the best advantage and under expert medical supervision.

Quite soon after the discovery of radio-activity and the isolation of radium salts in a state of purity, analyses were made of a number of these mineral springs with a view of ascertaining whether they possessed radio-active properties. The large number of such analyses may presumably be taken as an index of the interest and importance attached to them, and these can be seen on looking over the numbers of the periodical, *Le Radium*.[2] Practically every issue between the years 1904 and 1907 contains accounts or notes of the radio-activity of water, soil, and air in different localities. A large number of therapeutic springs were found to show radio-activity, due sometimes to the presence of traces of radium salts and in others to traces of radon in solution. The question naturally occurred as to how far radio-activity had a part in the undoubtedly excellent results obtained in the treatment of various disorders at the spas in question.

Among other sources examined for radio-activity was the mineral water in the St. Joachimsthal district, whence the first ores yielding radium had been obtained. Upon these and other natural waters a large number of observations were made by Mache and others (1905).[3]

About the same time were published many of the earlier observations upon the biological action of radium radiations. These, as in the investigation of all new phenomena, were of very differing values, and indeed it has taken years of careful work to appreciate the difficulties which are inherent in such researches. Needless to say, some of the actions attributed to radio-activity were far-fetched or even fantastic. One writer, for instance, described radio-activity as an essential feature in plant growth, until it was shown that his results were due not to radio-activity but to moisture! In a different category were the observations of Darier[4] (1904), who described the analgesic effects produced in certain rheumatic cases by the surface application of radio-active materials of a low degree of activity.

Dawtwitz[5] (1906), in a résumé of what was then known of the action of radium radiations, mentioned that the Joachimsthal miners, although exposed to all kinds of adverse climatic conditions, never developed gouty, rheumatic, or neuralgic complaints. How far the observation was accurate may be questioned, since he went on to say that when anybody (presumably a stranger) was troubled with any of these symptoms, the patient procured a portion of the radio-active residue of the mines and wore it about his person, in a small leather pouch; after a short period he experienced alleviation or disappearance of his pains. The latter statement does not carry conviction, since potatoes, dried toads, and other similar amulets have been credited with the same powers.

Various isolated observations upon the real or supposed action of radium radiations on living organisms were published about the same time. Wintrebert[6] (1906) recorded that the tadpoles of *Rana viridis* had their growth and development accelerated when allowed to live in the radio-active waters of Plombières, as contrasted with those kept under similar conditions in ordinary water. Löwenthal[7] (1906), after noting radio-activity in the expired air and urine of persons who had inhaled traces of radon, mentioned that normal persons seemed unaffected by it, but that arthritic subjects developed increased pain and swelling in the affected parts. Gudzent[8] (1910) read a communication before the International Congress on Radiology and Electrotherapeutics, held in Brussels. His paper—upon the influence of radium upon metabolism—covered a wide field, and summarised the biological effects of radiation as they were known at the time. Prominent among these effects were an enhanced activity of digestive enzymes, the destruction of toxins, the bactericidal action of certain naturally occurring waters with radio-active properties and the action upon purine bases. Mesernitzky[9] (1912) published the results of his experiments with purine bases when exposed to radon in vitro, and described destructive effects which, however, were not confirmed later in the same year by Knaffl-Lenz and Wirchowski.[10]

We are not for the present concerned with the contradictory findings in the last cases, nor with the fact that a great many conclusions—such as those upon enzymes—have been negatived by subsequent research. What is abundantly evident is that it was considered at least probable that the radiations from radium and radon would be of inestimable value in the treatment of what are broadly termed arthritic and neuralgic conditions, while its effects on digestion and the body generally might be expected to be of a most decidedly "tonic" character.

About the same time treatment of disease by the inhalation of air containing traces of radon was largely carried out on the continent by means of "emanatoria."

Spas and Radio-activity

Thus the balance of probability regarding the action of radium radiations on the human organism to a casual onlooker would be that their general action was essentially stimulative and "tonic," and that arthritic and neuralgic conditions would be improved under their action. Examination of therapeutic mineral waters proceeded apace, and Schmidt and Kurz[11] published analyses—probably the most complete yet recorded—of over a hundred continental mineral springs.

The tendency to associate radio-activity and beneficial effects was doubtless very natural, but it must be remembered that the amount of radium emanation in even the most powerfully radio-active of these waters is almost infinitesimal. The same holds good of the radon present in the air used for inhalation in emanatoria. Thus the maximum content of the Bath waters is given by Ramsay[12] as 1·73 millicuries per million litres; the corresponding figure given by Makower[13] for the Buxton waters is 1·1 millicuries per million litres. These concentrations are far less than would be used in any in vitro

experiments. When it is realised how many variables are introduced when a patient undergoes treatment at one of these spas, how the routine of life is changed, the diet regulated, and the whole daily existence of the individual carried out under more or less strict medical supervision with or without the addition of further therapeutic measures such as electrotherapy, massage, ultra-violet rays, and medically designed exercises, it is difficult to credit the traces of radio-activity in the waters with any part in the undoubtedly beneficial results often attending spa treatment.

In any case it must be remembered that these mineral waters are not simple solutions of radon, but contain a number of dissolved electrolytes, which are present in relatively large proportions.

In the interesting little official handbook, "The Spas of Britain," [14] nine British spas are dealt with. Six of these claim radio-activity in their waters; but of the remaining three, wherein no such claim is made, one records "unique results" in the treatment of gastro-intestinal intoxication, neurasthenia, arterio-sclerosis, chronic gout, and rheumatism.

In our opinion the evidence that radio-activity plays any curative part is quite inadequate. The only way to settle the point would be for a simple watery solution of radon, of the same order of concentration as occurs in the natural waters, to be administered under carefully regulated conditions. As such an investigation has already been undertaken by Dr. F. D. Howitt we may hope for more light upon this very interesting subject in the near future.

The Known Toxic Effects of Radium

Attention was first drawn to the toxic effects of radium by Dr. Harrison S. Martland [15] in 1925. The cases occurred among women employed in painting luminous watch-dials at a factory in New Jersey, U.S.A., and the first case was one of necrosis of the jaw which was at first supposed to be syphilitic; subsequent cases occurred, and up to May, 1931, 18 deaths had been recorded among these workers. Investigation showed that the results, sometimes fatal, were due to poisoning by the radio-active materials used in preparing the luminous paint. Radium was used in the form of radium sulphate, while other radio-active derivatives of thorium were also employed. The girls made a practice of "pointing" their brushes charged with the radio-active material in the mouth. Precisely how absorption of such an exceedingly insoluble substance as radium sulphate was brought about we do not at present know, but the presence of radio-active deposits in the bones was proved beyond all question. Osteitis, necrosis, and blood changes were among the conditions produced.

In a recent paper Dr. H. S. Martland wrote "the radium cases should be looked upon as an unfortunate but valuable experiment in which through ignorance and lack of proper governmental supervision human beings have been allowed to swallow, over long periods of time, radio-active substances." In the same paper (1931) Dr. Martland also makes reference to 30 persons who are still alive and known to be suffering from the effects of the ingestion of radio-active materials.

A more terrible consequence of this was reported by the same author in 1929. Two patients developed bone sarcomata, and at the time of his last (1931) communication, three more deaths had occurred through bone sarcoma, making a total of five in all. Five deaths from bone sarcoma, some showing extensive metastatic deposits in the internal viscera, out of a total of 15 deaths attributed to poisoning by radio-active material gives an incidence of 27 per cent.; when it is remembered that the average incidence of bone sarcoma ordinarily is only 0·07 per cent. the figures are surely of terrible significance.

The point which is of especial interest here is a comment by the same author upon the sale of radio-active waters "for the cure of everything from ingrowing toe-nail and alopecia areata to the sexual impotence of senescency, high blood pressure, chronic arthritis, and arterio-sclerosis." He proceeds to the following significant statement:

"A few months ago I was called to testify against the interstate sale of vials of mesothorium and radium, to be ingested after dissolving in water for the cure of most of the ailments of mankind. *The directions called for the consumption of one vial or more every day for at least two to three months, or longer. The amount of radio-active substances to be swallowed per day equalled that taken by some of the dial painters.*" (The italics are ours.)

Reference is next made to two specific instances where the unfortunate patients had been induced to swallow this horrible nostrum for between one and two years. Both developed necrosis of the superior maxillæ, and in one case there was almost complete sloughing of the bone. The presence of radio-activity in both of these sufferers was demonstrated and measured by physical methods.

From this it is perfectly clear that quack preparations, which are of a sufficiently high degree of radio-activity to produce osteitis and subsequent necrosis, have found their way into the American market.

It should be noted that in all the cases of sarcoma attributed to the ingestion of radium by the dial painters, the neoplasm developed in the site of a radiation osteitis. The bones affected included femur, scapula, pelvis, ribs, and orbit, and the growth was of a highly malignant metastasising type.

As regards the amount of radium necessary to produce radiation osteitis, Dr. Martland came to the conclusion that ten microgrammes distributed over the whole skeleton would be sufficient to produce a horrible death years after it has been ingested. Now a "microgramme" is one thousandth of a milligramme (0·001 mg.); hence the lethal dose in some cases at any rate is of the order of 0·01 mg. distributed over the whole skeleton. The lethal dose of tetanus toxin (we quote Dr. Martland's figures) is 0·22 mg. Tetanus toxin, so far as we know, formerly had the reputation of being the strongest poison known. Radium is admittedly slower but even more sure; antitoxin has been prepared for tetanus, but for the sufferer from radium poisoning there is no antidote, only the certainty of fatal termination, either by necrosis and sloughing of the bones or by the development and spread of one of the highly malignant types of cancer.

Nobody, we conceive, will, after this evidence, fail to concur with Dr. Martland's opinion that the 'indiscriminate sale of these waters by laymen and quacks is criminal."

In some of these cases of sarcoma produced by radio-active materials there were no preliminary warnings. Dr. Martland specifically quotes one case in which attention was called to the condition by a spontaneous fracture, and states that, but for the accident and the X ray and other examinations consequent upon it, the patient would have been accepted as a first-class life by any ordinary insurance company.

The Use of Radium in England by Unqualified Persons

Radium quackery is no new thing in this country. Before the war the name of radium was exploited for the sale of so-called (artificial) radio-active waters at prohibitive prices. In those days the special object promised was the treatment of malignant growths. As an example of this we may instance a case reported to one of us by the patient's own medical attendant.

The diagnosis pointed to an abdominal neoplasm; it was considered inoperable. The patient privately consulted one of the quack fraternity who advised a course of "radium water" which was sold at about half-a-crown for two ounces. With this was combined residence at a "home" and special dietary. The fees were considerable, and, as the diet consisted mainly of carrots, the profits to the owners corresponded in magnitude. A subsequent post mortem showed carcinoma of the pancreas with numerous metastases, a diagnosis which was as obviously impossible to the quacks as the decipherment of a cuneiform inscription in the British Museum.

The events of the war put a stop to these activities, but a keen interest in "rays" seems to have possessed

the mind of the public since. The valuable effects of ultra-violet rays, properly used, and of X ray diagnosis would appear to have opened up a kind of mental connexion between "rays" and "cure," while the very name of radio-activity may have suggested occult powers of mysterious and far-reaching extent. The undoubtedly good results attending radium therapy in some forms of malignant disease are also of very great weight in this connexion. The line of argument used by the quack being that as cancer is very intractable but yields to radium, so must *a fortiori* all other diseases yield to the agent which is able to "cure cancer."

There is no doubt that the public here as well as in other countries is being exploited by being induced to buy "radium preparations" which are in most cases devoid of any therapeutic value, and, what is far worse, are likely to be injurious to those that use them. The preparations are varied, and range from drinking waters and pills to hair-restorers, soaps, and other toilet preparations as well as to confectionery, such as chocolate.

In many samples which have passed through our hands it has been possible to show that quantities of radio-active material are present; so that the charge against the vendors of these meretricious articles is not that they do not contain what they claim to, but the far more serious charge that the articles actually contain a deadly poison.

The advertisements of these nostrums are usually framed in a manner to catch the eye; and involve the promised cure of such conditions as debility, sterility, insomnia, headache, and a host of other diseases such as often tax medical skill to the utmost. Now it is obvious that such states as we have named are among those which are likely to be most prevalent and cause distress in the more well-to-do members of society, and hence the vendors of this trash ask, and receive, a high price. The public is attacked by means of handbills, often distributed in the street, and one now lying before us is a masterpiece of ignorance and impudence. Its language is not altogether unsuggestive of an alien origin; its account of the marvels of radium we frankly admit to be quite new to us and, so far as we know, completely original. The list of diseases to be benefited comprises "asthma, arthritis, anæmia, rheumatism, lumbago, sciatica, gout, backache, gall-stones, kidney disease, headache, insomnia, nerve troubles, chest troubles." Surely a sufficiently comprehensive list, especially when tuberculosis and deficient "general and sexual vitality" are added, as they are, in another place.

We have thought it our duty to place this matter before the profession, and have been induced to do so not only by Dr. Martland's revelations, but by the increasing numbers of advertisements of these nostrums which fall into our hands. Needless to say, we do not receive them from the vendors of this poisonous rubbish, but it is abundantly clear that they are widely circulated and in increasing numbers. While fully endorsing every word Dr. Martland has said upon the subject we desire to go one step further, and to claim that all radio-active preparations designed for internal consumption or intimate tissue contact—such as radium-impregnated water, radium hair restorer, radium pills, or radium chocolate—should (if their sale cannot be absolutely prohibited—and why not?) be clearly labelled "poison" and generally made to comply with the regulations governing the sale of poisons.

One thing about such preparations is perfectly clear: if they are not radio-active as they claim to be, they are fraudulent. If they fulfil that claim they are poisonous.

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A CENTENARY AND A JUBILEE

THE twenty-five year jubilee of the National University of Ireland coincides this year with the centenary of the oldest of the Dublin medical journals now surviving—the *Irish Journal of Medical Science*. Founded by Robert John Kane at a time of literary and industrial stagnation following the union of the English and Irish parliaments, it appeared first as "The Dublin Journal of Medical and Chemical Science, exhibiting a comprehensive view of the latest discoveries in Medicine, Surgery, Chemistry and the Collateral Sciences"—comprehensive indeed, to cover so wide a field. Among the distinguished editors of the journal were R. J. Graves, William Stokes, and Arthur Jacob, the anatomist and oculist. The name of the journal suffered several vicissitudes; it was called, successively to its original title, "The Dublin Journal of Medical Science," "The Dublin Quarterly Journal of Medical Science," and eventually, the *Irish Journal of Medical Science*; the journal appeared as a quarterly only for a time between 1845–1871, reverting then to monthly publication. In all its metamorphoses it has preserved a reputation for the publication of original work, and the centenary number contains a symposium worthy of this tradition. The issue forms the collective contribution of the honorary Fellows of the Royal Academy of Medicine in Ireland, with the single exception of Dr. T. P. C. Kirkpatrick, general secretary to the Academy. Articles have been contributed by Dr. George Crile on the diagnosis and treatment of hyperthyroidism, by Sir Robert Jones on certain fractures of the shoulder, by Prof. Oskar Frankl on adenomyosis uteri, and by Prof. J. L. Faure on treatment of cancer of the cervix uteri by extensive hysterectomy. The history of the journal is recounted at length by Dr. Kirkpatrick in his article on the Dublin medical journals, and more briefly by Sir Humphry Rolleston in writing of Sir Dominic Corrigan. Sir Humphry mentions that THE LANCET, in 1830, when actively supporting Corrigan against an attack made on him by James Hope, refers to the journal in which the attack was made (*London Medical Gazette*) as "the filthiest vehicle that ever sprang from the prostitution of typography." Such vituperation was characteristic of the journalism of the age. Prof. E. Hastings Tweedy has contributed obstetrical recollections covering half a century, and his article is particularly interesting when read in conjunction with Prof. J. M. Munro Kerr's paper on advances in gynæcology in the past fifty years.

The jubilee of the National University of Ireland has been marked by the publication of a handbook, admirably illustrated by photographs and drawings, in which the origin of the University, and the achievements of the past 25 years, are described. Education in Ireland suffered in the past through well-meaning attempts to provide a curriculum which made little appeal to the tastes and traditions of the Irish race. The Queen's University, with colleges at Cork, Galway, and Belfast, founded through the activity of Sir Robert Peel, received at first a chilly welcome. The Catholic University was established, almost as a rival, under the directorship of John Henry Newman,

and was supported by voluntary gifts, but its examinations had no sanction from Civil Law. An advance was made in 1882 when the Queen's University was converted to the Royal University, with a senate empowered to examine candidates from any institution inside or outside Ireland. In 1907, through the agency of Mr. Augustine Birrell, an Act was passed confirming the Queen's College at Belfast as a separate university, and providing for a new Federal University to embrace the colleges at Cork and Galway as well as the colleges started by Newman in Dublin some fifty years before. This Act, and a subsequent one in 1908, established the National University and raised it to the status of a teaching as distinguished from an examining institution. It consists to-day of University Colleges—the old Queen's colleges—in Cork and Galway, of University College, Dublin, and of St. Patrick's College, Maynooth. The high standard of scholarship maintained in these colleges can best be appreciated by a study of the accounts of them which appear in the jubilee handbook.

AN IDEAL CATALOGUE

MANY serious doctors will recall, as their first introduction to the joy of handling good catalogues, the cheerful wintry afternoons which as children they spent poring over the stout book sent year by year by "the Stores" to their homes. In those days the arrival of the new volume was welcomed chiefly as the signal for release of the obsolete one for business with scissors and paste. The taste thus acquired is not easily lost, though the criteria by which a catalogue is judged may alter with the acquisition of professional responsibilities. Clear pictures of the articles available are still desired; but the ideal catalogue for the use of doctors must contain also the price of each item, with full details of variations in size, shape, or material, and a reference number to make it easy to send precise orders. It should also be agreeable to handle and have a full index. All these requirements seem to be met by Catalogue No. 60 (Surgical Sundries), issued by the Medical Supply Association, Ltd., of 167, Gray's Inn-road, London, W.C.1. It includes rubber, enamelled iron, glass and earthenware, urine analysis and dispensary equipment, nursing and orthopædic appliances, drugs, dressings, and industrial first-aid equipment. Only those sections, such as that on drugs, which do not lend themselves to illustration lack pictures, and there can be no possible doubt that the prospective purchaser knows exactly what he is ordering, even to the form of a safety-pin. Glancing through the catalogue we notice a mat specially marked in spaces, with sets of footprints suitable for children of different sizes, for use in connexion with remedial exercises; a self-sealing cardboard box for dispatching bottles of medicine by parcel post; and a collection of instrument cabinets and tables from which it should be easy to make a selection for any purpose.

AMBERGRIS

THE word ambergris links itself in imagination with the rulers of Tarshish and Sheba; with ivory, apes and peacocks, cedar wood, and myrrh. The Chinese name for ambergris is "dragon's spittle," and Mr. Bernard E. Read, writing in the *Chinese Medical Journal*, of May, 1932, quotes from ancient Chinese accounts of the origin of ambergris, which, after all, are not far removed from modern knowledge. In the spring, says Lung Yen, schools of whales vomit the drug, which floats on the surface of the water. In the fresh state it is like fatty gum, and yellowish-white in colour, but when old it is purple-black, "like flying fox dung"—a description which will help few to recognise it. However, it has other distinctive properties; a drachm of it may be chewed in the mouth and has a slightly fishy taste; left in the mouth overnight it leaves a mucilaginous mass on the tongue, which, marvellously, still weighs exactly one drachm. Like chewing gum it is everlasting, and can be chewed "for many tens of years" without losing weight. Another ancient author describes how it is collected. Whenever there is a typhoon the dragons rise to within less than a hundred feet from the surface; with red beards, golden scales, and eyes like lightning, they spurt the essence "like a pure spring sprayed like rain . . . This is ambergris." After tasting dragon's blood, Siegfried, it may be remembered, understood the song of birds. It is disappointing to find dragon's spittle endowed only with the properties of a patent medicine, potent though those are. For we find ambergris, or dragon's spittle, recommended for gravel, stoppage of the bowels, asthma, angina pectoris, and cardiac pain; It is a circulatory stimulant, an aphrodisiac; promotes the growth of marrow, gets rid of the body parasites of a tuberculous patient, exorcises evil spirits, and is valuable in cases of possession by devils. It also occurs in a prescription for the elixir of life.

Romantic tradition is not so far removed from fact. Ambergris is known for its power of preserving volatile principles in perfumes and incense, for, though its own smell is rank, it is effective in fixing delicate floral odours. It consists of a fatty material analogous to cholesterin, and is believed to be a secretion from the intestine of the whale. When burned it forms a peacock-blue smoke which remains for more than an hour, and can be cut into strips with scissors.

BRAILLE BROADSHEETS

Dr. F. W. Alexander's latest invention for the blind is a device whereby sheets of Braille can be rapidly duplicated in large numbers. There are at present only three places in this country where Braille is printed—two in England and one in Scotland—and their machines are kept so busy that it is hard for institutions and individuals to get things printed at short notice. His object was to find a method of duplication which would make it possible, for instance, to translate articles or puzzles into Braille on the very day they appeared in the newspapers. Using a special frame and die, he finds it an easy matter to hammer out the Braille on a couple of sheets of zinc, one laid over the other. If a sheet of paper is placed between the two sheets of zinc the bosses will be reproduced on the paper when the sheets are pressed together; but the practical difficulty was to apply the pressure without damaging the metal sheets. Dr. Alexander got his inspiration when looking into a shop which sold laundry appliances. In the window were some wringers or mangles with indiarubber rollers "guaranteed not to break buttons." Their cost was 30s., and Dr. Alexander found they served his purpose exactly. He has sent us examples of acrostics, anagrams, and other word puzzles which he has been able to reproduce in quantity at great speed and small cost, and there seems to be no reason why schools and other institutions possessing this simple apparatus should not be able to issue notices, examination papers, short stories, and other literary entertainments for blind people without having to send them to a printing works. The use of a Braille typewriter for such copying would be extremely tedious, and we congratulate the inventor on what seems to be a really useful advance in his attempt to make the life of the blind more worth living.

Dr. Alexander has also improved his key-sheets for learning and teaching Braille. The original arrangement was a board with large-headed nails to represent the Braille dots, and small-headed nails to indicate the relative position of the large nails in the Braille sextet (THE LANCET, 1931, i., 1006). The new version (which is obtainable from him at Bankside, Ferry-road, Teddington, Surrey) is made of thick paper on which the dots are embossed. It can be produced, he says, at about a penny.

ENLARGEMENT OF RETFORD HOSPITAL.—Lady Whitaker recently opened a new wing of this hospital which has cost £9000. The enlargement comprises new casualty, out-patient, X ray and massage departments, and some private wards.